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**B**eginning in the state of New York, the main stem of the Delaware River flows for more than three hundred miles before entering the Atlantic Ocean through the Delaware Bay. The river and its numerous tributaries constitute the Delaware River Basin, which encompasses 13,600 square miles in the states of New York, Pennsylvania, New Jersey, and Delaware, as well as a small area in Maryland. The river contains several branches and tributaries, including the Lackawaxen, Mongaup, Neversink, Lehigh, Schuylkill, and Christina rivers. These serve many purposes, such as providing recreational opportunities and water supply to a large population. Yet the river, described in 1609 by Henry Hudson as “one of the finest, best and pleasantest

“rivers in the world,” can sometimes turn destructive, overflowing its banks and flooding communities and homes. More commonly, however, the problem has been too little water—droughts that diminish the amount of water the populations of Pennsylvania, New Jersey, New York, and Delaware can use. Drought has also periodically led to saltwater intrusion from the Atlantic Ocean. The Philadelphia District of the U.S. Army Corps of Engineers has battled these issues for most of the twentieth century and into the twenty-first. In the years since 1972, its work in these arenas has become increasingly complicated, as many groups—both environmental and political—have staked out an interest in water management.

*Facing page: Francis E. Walter Dam at maximum discharge in September 2004, returning to normal reservoir levels following Tropical Storm Ivan*



In 1955, Hurricanes Connie and Diane rocked the North Atlantic region, spreading destruction and devastation in their wake. One report said, “Bridges along the Delaware were washed out, homes and businesses were destroyed, 99 people died.”<sup>1</sup> The extent of the damage caused many to clamor for additional flood protection in the Delaware River Basin. A year earlier, the U.S. Supreme Court had issued an amended decree to govern water distribution on the Delaware River, which allowed approximately 900 million gallons of water a day to be extracted from the river for water supply purposes. With such heavy demands, residents of the states of

New York, New Jersey, Delaware, and Pennsylvania needed additional water supplies.<sup>2</sup>

By the mid-1950s, the Philadelphia District had already been working for several years on a comprehensive plan (initiated in 1950) for the Delaware River Basin, but the hurricanes and the Supreme Court decree caused the Corps to reevaluate its plans. After conducting numerous “water use studies based on present and project populations and economic activities in the basin and adjacent areas,” the district presented a plan to Congress in 1962.<sup>3</sup> This plan envisioned the “eventual construction of 58 reservoirs to meet projected demands over the next 50 years for municipal and industrial water, recreation, flood control, hydroelectric power, and related purposes.” To begin, the Corps asked for authorization to construct “8 of the 19 major control structures at sites designated as Beltzville, Blue Marsh, Trexler, Tocks Island . . . , Aquashicola, Maiden Creek, Prompton and Bear Creek ” (the last two were modifications of existing projects). The

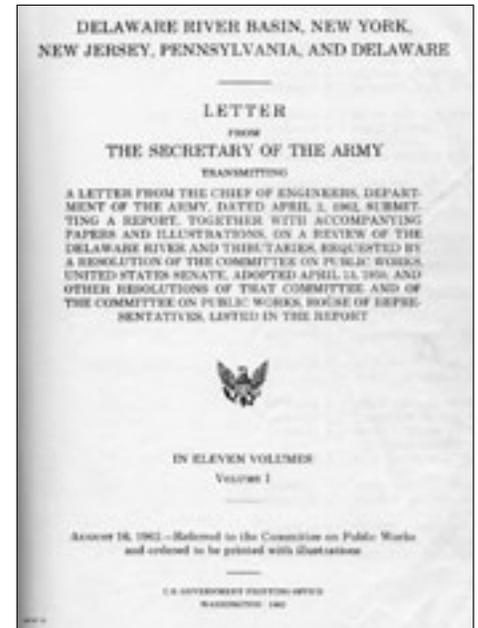
Corps estimated that the complete development of the plan would cost \$591 million—\$232 million from the federal government and \$359 million from a nonfederal sponsor.<sup>4</sup>

Throughout the 1960s, the Philadelphia District worked to implement the plan's recommendations. All components of the district—including planning, design, engineering, and construction personnel—were involved in water resources projects. The district conducted reconnaissance and feasibility studies for dams such as Tocks Island, Blue Marsh, and Beltzville, while the Corps worked closely with the Delaware River Basin Commission (DRBC), created in 1961 as “a regional body with the force of law to oversee a unified approach to managing a river system without regard to political boundaries.” The DRBC consisted of the governors of New York, New Jersey, Delaware, and Pennsylvania, as well as a federal representative, originally from the U.S. Department of the Interior but later designated as the division engineer of the Corps’ North Atlantic Division.<sup>5</sup> For some

of the projects proposed in the Comprehensive Delaware River Basin Plan, the DRBC served as the local sponsor and representative. Working with the DRBC, the Philadelphia District had either completed or placed under construction several elements of the plan by 1972, but politics, funding issues, and environmental concerns would soon halt efforts to construct Tocks Island Dam—the linchpin of the plan—and then Trexler Dam.

## Tocks Island Dam

The Tocks Island Dam was one of the most important projects on the Philadelphia District’s horizon in the 1960s and 1970s. Several studies—including a book and several master’s theses and doctoral dissertations—have been produced on the project. Unlike those works, this history does not present an exhaustive study of Tocks Island. Instead, it focuses primarily on the district’s role in this project and on the effect on the district of the demise of the project, while also noting the changing national context in which the district was working in the 1970s and beyond.



*The Delaware River Basin Comprehensive Plan, as transmitted to Congress*

Geographer Gina Bloodworth noted in a dissertation on the Tocks Island Project that the 1970s saw a transition in the nation's focus on water resources to "a more transparent decision-making process that included public input" and an "increased emphasis on preserving environmental quality and values."<sup>6</sup> This shift in thinking affected the Corps' ability to continue with the Tocks Island Project and ultimately affected the amount of work the Philadelphia District had on the horizon. Tocks Island is a good example of how the context of the times affected Corps projects.

Because of the massive scale of the project, especially in the eastern United States—a dam 3,200 feet long and 160 feet high that would create a thirty-seven-mile-long reservoir, construction of which would directly affect six counties across New York (Orange), New Jersey (Sussex and Warren), and Pennsylvania (Pike, Monroe, and Northampton)—the implementation of the project required a large amount of the district's time and resources. One source

said that, if constructed, Tocks Island would be the eighth largest dam project ever attempted by the Corps. Accordingly, as one district publication related, "No enterprise enlisted more . . . talent during the late 1960s than the Tocks Island multipurpose flood control project."<sup>7</sup> But Tocks Island came under fire in the 1970s from a host of opponents, who attacked it for the environmental degradation it would supposedly cause and for its elimination of a scenic portion of the Delaware River. Supporters of Tocks Island and representatives of both the Corps and the DRBC responded that the dam was the most efficient way to provide the flood control, water supply, and recreation the Delaware River Basin needed. The opposition was not swayed, however, and the project was eventually scuttled, which had a dramatic effect on the Philadelphia District's workload.

The Corps had studied the potential construction of Tocks Island Dam for many years. In 1934, for example, the Philadelphia District presented a report to Congress on the Delaware

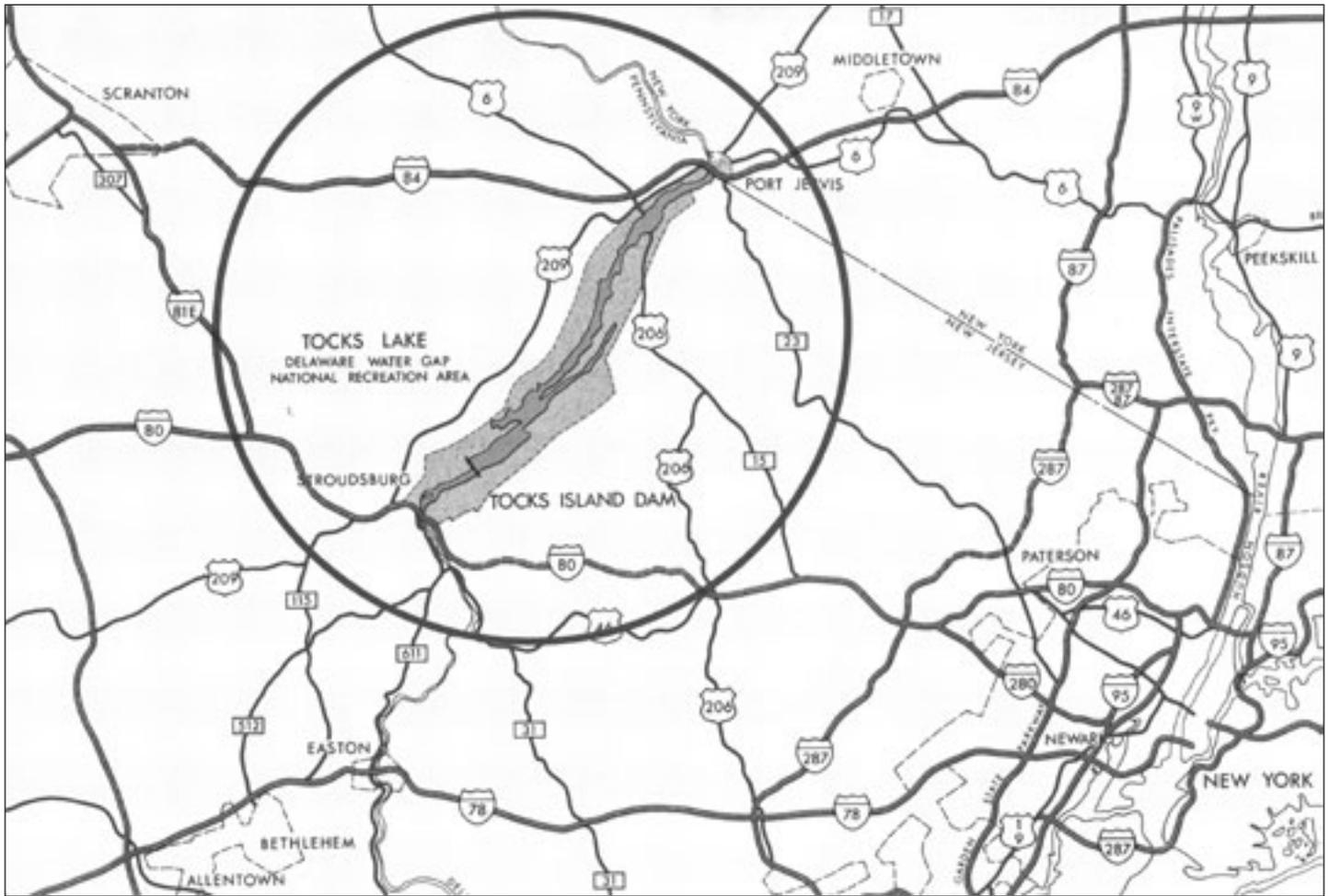
River Basin that, according to one source, “was the first comprehensive water-resources plan ever developed” for that basin. It proposed the construction of dams at thirty-four sites, including Tocks Island, located on the main stem of the Delaware River approximately five miles upstream from the Delaware Water Gap and seven miles northeast of Stroudsburg, Pa. The 1934 proposal called for a reservoir that could hold 214 billion gallons of water at Tocks Island for water supply and power production. But funding was not forthcoming for the project, and in 1939 Congress asked the Corps to reexamine the report. Subsequent onsite boring tests revealed that a large dam was impracticable because of foundation issues; by the mid-1940s, the proposal for a dam at Tocks Island seemed dead.<sup>8</sup>

After the devastating storms of 1955, however, and with the increasing need for water in the area, the chief of engineers directed the Philadelphia District to again examine the most effective ways of controlling floods and providing water. Later that year, the U.S.



Senate Committee on Public Works passed a resolution requesting a review of Delaware River Basin reports. In 1956, the committee

*The reservoirs originally planned for construction under the Delaware River Basin Comprehensive Plan*



*Location of the proposed Tocks Island Reservoir*

passed another resolution calling for the Corps to specifically study the construction of a dam on the main stem of the Delaware River, either at Wallpack Bend or at Tocks Island. In the course of completing these studies, the Corps determined that a dam was feasible at Tocks Island as long as it was an earthfill dam and was in a slightly different location than the one previously explored. Such a reservoir, the Corps said, could provide twice

as much water storage as one at Wallpack Bend. The Philadelphia District made its preliminary findings public in January 1959; in 1962, it issued an official proposal for the construction of a dam at Tocks Island. Estimated to cost approximately \$146 million, the dam would be a “multiple-purpose development” that would “provide supplies of water, flood control, production of hydroelectric power, and . . . recreation”

opportunities. More than half the potential storage of the reservoir would be used for water supply, recreation, and power generation, with the balance set aside for flood control and as sediment reserve. According to the Corps' plans, the Philadelphia District would begin constructing the dam in 1967 and would have it fully operational by 1975. Congress authorized the project in the Flood Control Act of 1962, and the DRBC included it in its own comprehensive plan for the Delaware River Basin that year, becoming the nonfederal sponsor of the project in 1965.<sup>9</sup>

Throughout the 1960s, the Corps completed planning and preliminary design for the dam's construction. In the meantime, Congress expanded the recreational aspects of the project in 1965 by establishing the Delaware Water Gap National Recreation Area, administered by the National Park Service (NPS), on 46,000 acres of land surrounding the proposed dam site. Congress appropriated funds to purchase the 46,000 acres from existing landowners, and the Philadelphia District's Real Estate

Division was placed in charge of negotiating such purchases.<sup>10</sup>

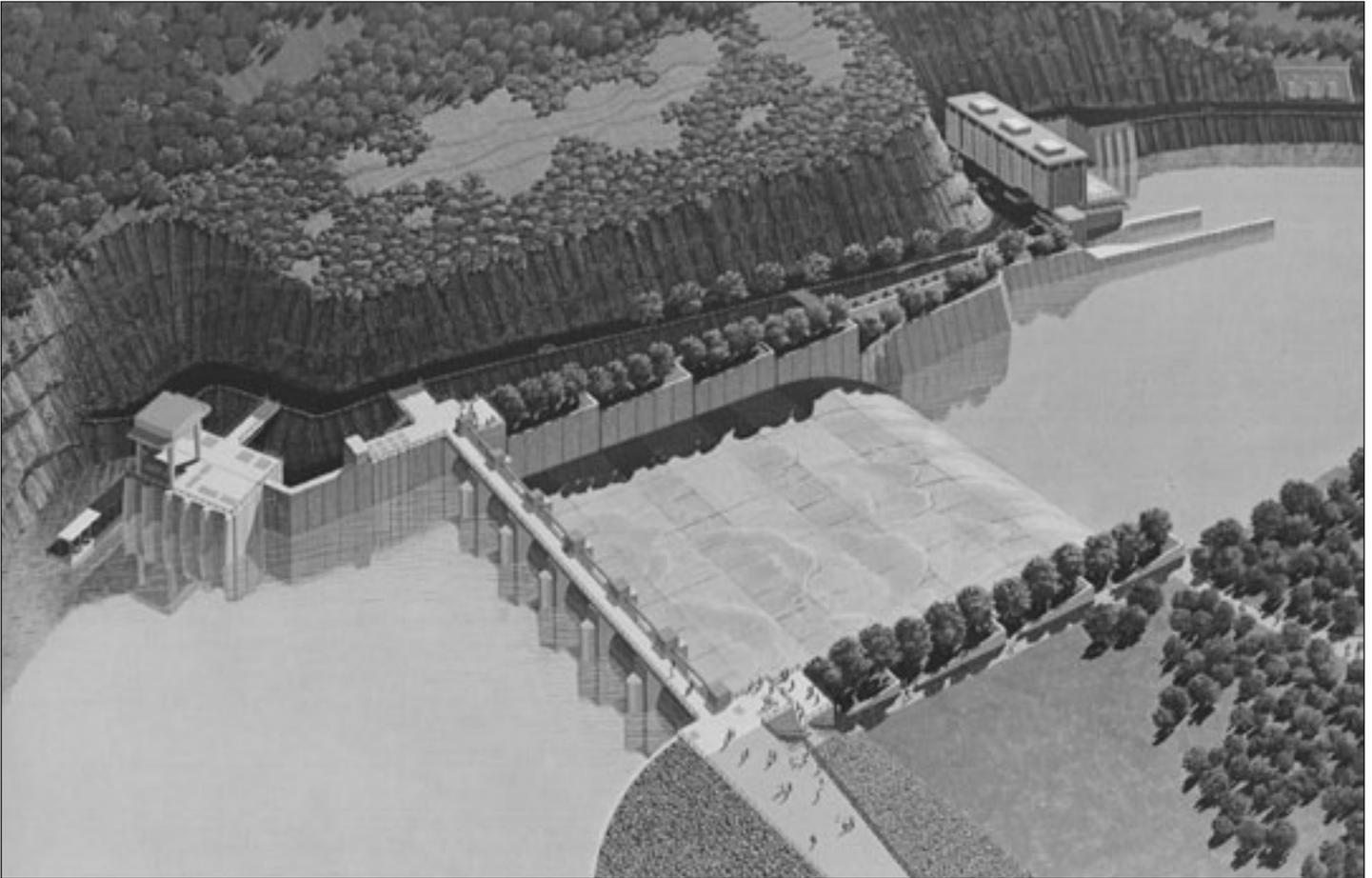
But, as the 1960s closed, trouble loomed for Tocks Island, in large part because of the Vietnam War and its drain on the federal government's finances. Lack of funding became an issue for the dam, especially as its cost escalated throughout much of the 1960s, reaching \$214 million by 1969. With the price tag rising and little money to spare, Congress asked the General Accounting Office (GAO) to investigate the dam's economics. The GAO focused on the Corps' benefit-cost ratio, projected at around 1:4.<sup>11</sup> The GAO claimed that recreational benefits were overstated while water supply benefits were understated. Although the GAO did not sound an alarm about the overall benefit-cost ratio, concern over the allocation of benefits, coupled with an austere budget that provided the Philadelphia District with only about \$2 million in fiscal year 1969 for construction purposes, meant that by the dawn of the 1970s, the Corps had not yet commenced construction.<sup>12</sup>

Ironically, although this initial delay had to do simply with finances, it created a window of opportunity that others proceeded to exploit—starting with those who sought to highlight the Tocks Island Project as potentially damaging to its surrounding environment. In 1970, the DRBC commissioned an environmental study of the project area by Roy F. Weston Inc. This study made various recommendations in terms of ensuring that the reservoir provided sufficient water supply, that a sewage plan be centrally administered by the DRBC, and that engineering studies on solid waste disposal be conducted, but it still considered Tocks Island a viable option.<sup>13</sup>

However, even with this study, and even though Tocks Island was originally authorized before the passage of the National Environmental Policy Act (NEPA) in 1969, the Philadelphia District had to prepare an environmental impact statement (EIS) before any construction could begin. The Corps submitted a draft EIS to the Council on Environmental Quality (CEQ) (as required by NEPA)

in February 1971, but the CEQ deemed it inadequate, in part for not exploring alternatives to the project more exhaustively and in part for not devoting more attention to potential eutrophication of the reservoir. Eutrophication—the process by which a water body becomes contaminated by nutrients such as nitrogen and phosphorous—was deemed especially important because it could affect the use of the reservoir for recreation.<sup>14</sup> The CEQ recommended that construction of the Tocks Island Dam be deferred until the Corps could satisfactorily address these issues and, in the spring of 1971, the undersecretary of the Army agreed.<sup>15</sup>

In October 1971, the Corps issued its final EIS on Tocks Island. This document stated that consultants hired by the Corps had determined that eutrophication in the reservoir was likely, in large part because of sewage and animal waste runoff from upstream dairy farms in New York. To combat that, the EIS said, the DRBC would develop a large wastewater treatment system in the



area. Environmentalists, however, were not satisfied by the EIS. In February 1972, the Environmental Defense Fund published its own evaluation of the Tocks Island Project. This document admitted that “legitimate needs for water supply, flood damage prevention, outdoor recreation, and peaking power exist in the Delaware River Basin,” but it did not agree that Tocks Island was the best way to meet these needs. The report criticized the Corps’ “calculations

and studies of the Tocks Island Reservoir water supply function” as “inadequate and misleading” and claimed that the Corps overestimated the recreational benefits of the dam. In terms of flood control, the report stated that, instead of constructing a large dam, the DRBC should use floodplain management to reduce flooding risks. Finally, the report said that “accelerated cultural eutrophication would have serious detrimental effects on the use of Tocks Island

*An artist's rendering of the proposed Tocks Island Dam showing the spillway with its tainter gates and stepped terraces, intake structure at left and powerhouse at right*



*A sign showing some of the opposition expressed over the Tocks Island Dam*

Reservoir for water supply and recreation” and insisted that the Corps require the DRBC “to implement an adequate wastewater treatment and control program for both point (municipal and industrial) and nonpoint (agricultural) wastewater sources” before beginning construction.<sup>16</sup> Russell Train, chairman of the CEQ, agreed with many of these criticisms and approached the governors of New York and other states in the Delaware River Basin to receive assurances that New York would take measures to prevent nutrient runoff into the reservoir and that Delaware, Pennsylvania, and New Jersey would provide

funding for the wastewater treatment system. When these assurances were not forthcoming, Congress “officially stopped the construction of Tocks Island Dam” in the summer of 1972.<sup>17</sup>

The situation worsened when Governor William T. Cahill of New Jersey (a DRBC member) declared in 1972 that the state wanted to reevaluate its support of the dam, in part because of the cost of the wastewater treatment plant and in part because he had concerns over the effects a large recreation area would have on his state’s roads and communities. This came as somewhat of a surprise; former Philadelphia District Engineer Col. James A. Johnson, who commanded the district from 1968 to 1971, noted that Cahill was very enthusiastic about Tocks Island in the late 1960s and early 1970s. Despite this initial support, on 13 September 1972, Cahill told the DRBC that New Jersey could support Tocks Island only if certain economic and social conditions were met.<sup>18</sup> Philadelphia District officials responded that Cahill was exaggerating the impact on New

Jersey of recreational visitation to Tocks Island and that the project should continue, independent of measures implemented by the states. However, in an effort to placate Cahill, they downgraded the estimate of proposed visitors to the dam to four million.<sup>19</sup>

Meanwhile, certain environmental and conservation groups opposed to the dam's construction became more vocal. One of these was the Delaware Valley Conservation Association, which in 1970 joined with the Leni Lenape League and local chapters of the Sierra Club to form the Save the Delaware Coalition, with a stated goal of halting the Tocks Island Project and creating "a park without a dam"—a natural recreation area in the vicinity of Tocks Island centered around the Delaware River. National organizations such as the Wilderness Society and Trout Unlimited also expressed their displeasure with the proposed project.<sup>20</sup>

At the same time, many local residents who did not want to sell their homes and farms for the dam's construction added their



*A model of the Tocks Island Dam*

voices to the chorus of disapproval. One journalist described the forces against Tocks Island Dam as follows:

From a comparative handful of local people, many of them landowners who tried to sue the government to stop the dam and recreation area . . . the anti-dam faction has grown to a large consortium of fishermen, who fear the loss of one of the best shad runs in the East; canoeists, who stand to lose one of the last stretches of white water in the East; environmental groups, elected officials, members of the Save the Delaware Coalition, the Environmental Protection Agency, the Council on Environmental Quality, and most recently, the Medical Society of New Jersey.<sup>21</sup>

Together, these organizations wielded considerable political power and even began commissioning their own studies of the Delaware River Basin, concluding that the Corps could pursue several alternatives besides dam construction to address flood control and water supply issues, including floodplain zoning and nonstructural flood control solutions.<sup>22</sup> The Corps disagreed substantively with these conclusions, arguing that “the Tocks Island Project meets . . . urgent human requirements in a manner that is more environmentally acceptable, efficient and economic than any other series of known or feasible alternatives.”<sup>23</sup> Likewise, the DRBC declared that “the Tocks Island Reservoir would be the keystone of the water supply management program in the Delaware Valley without an alternative, and the DR[B]C sees no alternative.”<sup>24</sup> From the perspective of former DRBC employee Richard Albert, the real argument over Tocks Island was an ideological one: “Either you believed that Tocks Island Dam was the long-awaited answer to the water needs

of the Delaware River Basin, or you didn’t.”<sup>25</sup>

As environmental groups and local landowners increased their opposition, a storm hit the Delaware River Basin in 1972 that affected views on the dam. Between 22 and 25 June 1972, Tropical Storm Agnes dumped water across Pennsylvania, bringing rainfall totals of between 5 and 18 inches to various locations. Schuylkill County, for example, received 14.8 inches of rain, and the entire commonwealth of Pennsylvania was declared a disaster area. The Delaware River Basin was not as hard hit as the Susquehanna River Basin, but the storm heightened in the minds of many the need for more flood control in the region.<sup>26</sup>

In Agnes’s aftermath, Philadelphia District officials declared that the storm showed the importance of Tocks Island. Had the storm taken a different route, they said, it could have caused damages exceeding those of the 1955 flood. As Colonel Johnson, District Engineer of the Philadelphia District at the time, later explained, “Had Agnes in



'72 been 50 miles to the east, the water level in Trenton [New Jersey] would have been 29 feet over the flood stage." Johnson said that Agnes still would have caused flooding, even if all of the Corps' authorized projects had been constructed at that time, but dams such as the one proposed at Tocks Island could have mitigated the damage.<sup>27</sup>

Meanwhile, the Corps faced criticism over its land acquisition methods. The Philadelphia

District was given the responsibility in 1967 of acquiring the land necessary to build the dam and reservoir; to relocate Route 209, a two-lane highway that would be flooded by the reservoir; and to create the Delaware Water Gap National Recreation Area. The duty of obtaining these approximately 72,000 acres, owned by approximately three thousand people, fell to the district's Real Estate Division, which established an office in East Stroudsburg with

*Upstream view of Tocks Island Dam as proposed*

approximately 120 employees. Understandably, this was a thankless job, as landowners were not happy about giving up their property, especially tracts of land that had been in a family for several generations. Many people who had to sell their land became bitter, blaming the Corps for everything from property loss to shortened life spans. As Colonel Johnson said, “There was one whale of a lot of emotion about those kinds of things.”<sup>28</sup>

In addition, after construction of the dam was delayed in the late 1960s and early 1970s, the Corps began leasing out properties that it had acquired to that

point, leading to an influx of “hippies” into the area in 1971. Some of these members of the counterculture had legitimate leases on properties, while others were merely squatters on the land. Regardless, locals who remained in the Minisink Valley resented this intrusion and, by extension, the Corps that allowed it to happen. The Corps took legal action against many of the squatters and, in September 1971, even began bulldozing houses, until the squatters placed themselves in the way of the machines. After numerous legal actions, federal marshals obtained authority to evict the squatters in 1974, but, as Richard Albert noted, “The squatter eviction generated a great deal of bad publicity for the Corps of Engineers.”<sup>29</sup> According to Vince Calvarese of the Philadelphia District, the bad feelings resulted in people “damaging our vehicles, putting sand in our gas tanks, and flat[tening] tires. We weren’t welcome.”<sup>30</sup> Looking back, John Burnes, Assistant Chief of the Engineering and Construction Division, said that the Tocks

*Some of the squatters who moved into the Minisink Valley*



Island land acquisition taught the Corps some lessons. Those dealing with land acquisition, he said, “weren’t integrated with the public affairs office,” nor were they “tutored in how to give a sound bite or anything else.” Burnes believed that Tocks Island taught the Corps the importance of public relations and of using a gentler approach when acquiring lands.<sup>31</sup>

Meanwhile, Congress still refused to appropriate more money for dam construction, even after the Corps requested the release of funds in fiscal year 1974. Part of the problem was that the growing local opposition to the project led the congressional delegations of New Jersey, Delaware, New York, and Pennsylvania to become “skeptical about the merits of the proposed plan.” When Brendan Byrne replaced Cahill as governor of New Jersey, he exhibited the same reluctance to support Tocks Island, while Malcolm Wilson, governor of New York, informed the Public Works Subcommittee of the House of Representatives in 1974 that

he was opposed to construction at that time. Because of these views, the DRBC could not come to a firm decision about whether or not to support dam construction. Although the DRBC was the local partner in the project, the fact that two of its governors opposed construction was problematic. These developments led Congress to request in the Fiscal Year 1975 Public Works Appropriation Act that an impartial restudy of Tocks Island be conducted under the supervision of the North Atlantic Division, in cooperation with the DRBC, by August 1975. The goal, according to a contemporary observer, was the completion of “an impartial, comprehensive analysis, including alternatives and review.” The Corps received \$1.5 million for the restudy in August 1974; in December, it selected engineering firm URS/Madigan-Praeger Inc. and architectural firm Conklin and Rossant for the review.<sup>32</sup>

In June 1975, the Corps released the report, *The Comprehensive Review Study of the Tocks Island Lake Project and*

*Alternatives* (informally known as the Madigan-Praeger study). This six-volume report attempted

to answer many of the lingering questions about the proposed Tocks Island Dam. It concluded that the project was the most cost-effective means to achieve the purposes of flood control, water supply, recreation, and hydroelectric development in the region. In terms of the reservoir's potential for eutrophication, the study said that "a consensus of opinion among limnologists, making independent rational scientific judgments about the lake once it is constructed, would be that it is eutrophic." However, the study team did not believe that eutrophication would adversely affect any of the project's benefits besides recreation. In the case of recreation, eutrophication would "have a detrimental effect," but some recreational purposes could still be served even with eutrophication.<sup>33</sup> Ultimately, the Madigan-Praeger study supported the Corps' view that the dam was both feasible and necessary but, as one scholar noted, it did nothing to change people's positions. "The environmentalists were still solidly against the dam,"



while “the business, labor, engineering, and water interests were clearly for it.”<sup>34</sup>

With environmental and local opposition mounting, the DRBC met on 31 July 1975 to decide whether or not to support the dam. In the course of this meeting, New Jersey Governor Byrne reiterated his opposition, although he held out the possibility of constructing the project after the year 2000. This reflected his view that for the next twenty-five to thirty years, New Jersey had sufficient water supply without the Tocks Island Dam, but after that it might need the water. He supported the continuation of land acquisition in case the dam was ever needed. New York Governor Hugh Carey (represented by Ogden R. Reid) and Delaware Governor Sherman Tribbitt also voted to withdraw DRBC support for the dam, while Pennsylvania Governor Milton Shapp voted in favor of the project. As the 1975 annual report for the Water Resources Association of the Delaware River Basin stated, “The Delaware River

Basin Commission on July 31, in a closed meeting, decided, in a split decision, against construction start at Tocks Island but for continuation of land acquisition for the Delaware Water Gap National Recreation Area.” Without DRBC support, North Atlantic Division Engineer Brig. Gen. James Kelly recommended to the chief of engineers that the dam be deauthorized, a recommendation that the chief transmitted to Congress in September 1975, stating that the Corps should transfer the land it had acquired for the project to the NPS for the Delaware Water Gap National Recreation Area.<sup>35</sup>

In accordance with the Corps’ request, Congress prepared bills deauthorizing the Tocks Island Project (the first of which had actually been introduced in 1974). In the summer of 1976, the Senate Subcommittee on Water Resources of the Committee on Public Works debated one of the bills, S. 3106. This bill would deauthorize the dam, transfer all the property acquired by the Corps to the NPS, give the NPS the authority to acquire any additional necessary

land for the Delaware Water Gap National Recreation Area, and authorize the Department of the Interior to relocate U.S. Highway 209 “in the manner in which such highway was to be relocated by the Secretary of the Army as part of the Tocks Island Reservoir project.”<sup>36</sup>

In the course of these hearings, Maj. Gen. Ernest Graves, Director of Civil Works for the Corps, presented the Corps’ position on Tocks Island. According to Graves, the Corps requested that the project “be deauthorized and that all land acquired, including real estate and legal obligations, by the Department of the Army pursuant to the project authority be transferred to the Department of the Interior on the assumption that the Congress authorizes expansion of the Delaware Water Gap National Recreation Area.” Graves explained that Tocks Island was “the key feature” in the Delaware River Basin Comprehensive Plan and that the Corps would have to “go fairly far back toward first base in order to put together a plan that would be workable,”

but if the DRBC did not support the project, it was better to deauthorize it than to let it linger. As the chief of engineers of the Corps had stated, according to one congressional delegate, “continued indecision will adversely affect needed present and future programs in such areas as non-structural flood protection, water supply, pollution control, regional and local planning, and land use controls.” According to Graves, the Corps had expended approximately \$63.5 million on Tocks Island up to that point, including 553 years of manpower. But the project no longer had adequate support.<sup>37</sup>

The testimony of senators and representatives from New York, New Jersey, Delaware, and Pennsylvania underscored the lack of support. Senators Clifford Case (R-N.J.) and Jacob K. Javits (R-N.Y.), as well as Congressmen Robert W. Edgar (D-Pa.), Benjamin A. Gilman (R-N.Y.), and Pierre S. du Pont (R-Del.), and Congresswomen Millicent Fenwick (R-N.J.) and Helen Meyner (D-N.J.), all opposed the

Tocks Island Project, with only Congressmen Frank Thompson (D- N.J.) and Edward J. Patten (D- N.J.) coming out in favor of the dam. Senator Harrison A. Williams, Jr. (D- N.J.) said that he would like to see a New Jersey water supply study completed before deauthorization occurred to ensure that the state did not need the Tocks Island Project for that purpose.<sup>38</sup>

However, several people appeared before the subcommittee in support of the project. Maurice K. Goddard, secretary of the Pennsylvania Department of Environmental Resources, represented Governor Shapp’s position on Tocks Island by stating that “the Commonwealth of Pennsylvania continues its support for immediate construction of the Tocks Island Dam and Reservoir project, as it has since the project was first conceived.” According to Goddard, deauthorizing Tocks Island would “put us right back to the point where we were 20 years ago, with no immediate means of meeting the present and future water



*Aerial views upstream (above) and downstream of the proposed dam site, taken in the 1960s—with inset photo showing same downstream area in the 1990s*



and water-related needs of the citizens and industry of the four-State basin and its service area.” Similarly, Joseph F. Radziul of the Philadelphia Water Department said that Tocks Island was the only way to ensure that the Delaware River Basin would not have “a serious water shortage” in future years. While not supporting immediate construction of Tocks Island, others advocated continued authorization of the project in the event the need for the dam and reservoir ever arose. For example, James W. Wright, executive director of the DRBC and a representative of Governor Tribbitt of Delaware, said that “too many issues remain unresolved as this time to risk the permanent foreclosure of the Tocks Island Lake project.” Wright was especially concerned about saltwater intrusion and whether nonstructural flood control measures could provide an adequate amount of protection. “Although the Delaware River Basin Commission member-States voted 3-to-1 against a motion recommending congressional

appropriation of Tocks Island construction funds,” Wright concluded, “only New York among the four member States has expressed support for deauthorization.” To Wright, this showed “the region’s uncertainty that there are easy means of filling the void of benefits left by the Tocks Island decision of last year.”<sup>39</sup>

Clearly, even with the DRBC’s opposition in 1975, there were strong feelings about hanging on to the project. Because of this, and because Congressman Thompson, who was the chairman of the House Administration Committee, opposed deauthorization, Congress passed no deauthorization bill in 1976 or in the years immediately following.<sup>40</sup> The Tocks Island Project continued to hang in limbo.

With the possibility of the dam still lingering, environmental groups and opponents aimed to ensure that no construction ever occurred by getting Congress to designate the Middle Delaware River as a wild and scenic river. The Wild and Scenic Rivers Act, passed by Congress in 1968, declared that rivers with

“outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values” would be “preserved in free-flowing condition.”<sup>41</sup>

Under the National Parks and Recreation Act of 1978, Congress added “the segment from the point where the [Delaware] river crosses the northern boundary of the Delaware Water Gap National Recreation Area to the point where the river crosses the southern boundary of such recreation area” to the National Wild and Scenic Rivers System (the law also added the upper Delaware River to the system). In addition, the act authorized the secretary of the interior to include all of the Tocks Island Dam land in the Delaware Water Gap National Recreation Area and to acquire land that the Corps had not yet purchased. In essence, the passage of this legislation killed Tocks Island Dam, although Congress did not officially deauthorize the project until 19 July 1992.<sup>42</sup>

In February 1979, the Philadelphia District ended its official involvement with the Tocks



*The Delaware Water Gap National Recreation Area*

Island Project by concluding the transfer of funds and property to the NPS. No longer involved with Tocks Island, the Philadelphia District did not have a robust workload. In 1980, its real estate function was relocated to the Baltimore District, and engineering, design, and construction of new projects were also eliminated. By 1981, the staffing of the district had decreased from nearly eight hundred to below six hundred, emphasizing the dramatic effect of the demise of the Tocks Island Project. In fact, some critics accused district officials of hanging

on to the project for just that reason, regardless of whether it was economically or environmentally justified. Corps officials responded that they saw the project as the best way to meet the region's needs and that they were doing what Congress had directed them to do. "Tocks Island wasn't authorized by a cadre of evil bureaucrats," Burnes said. "It was authorized by the Congress."<sup>43</sup> Regardless, the demise of the project had a direct and severe impact on the Philadelphia District.

The project also had a direct impact on the Delaware River Basin itself. Supporters continued to believe that Tocks Island was the best solution and, at various times in the 1980s and even into the twenty-first century, some talked about trying to resurrect the project. Whenever drought or floods hit the area, some people would restate the case for Tocks Island (in terms of water supply or flood damage reduction, respectively) and why it should have been built.<sup>44</sup> Despite the bandwagon effect of opposition from multiple interest groups that

led to the project's demise, two sides remained to this story, even decades after the fact. And while the debate may continue for years to come over whether Tocks Island was "the solution," the problems it was intended to help solve have not gone away.

## **Trexler Lake Project**

Tocks Island was not the only proposed project that experienced opposition in the 1970s. Another component of the Delaware River Basin Comprehensive Plan was the construction of Trexler Dam on Jordan Creek, a tributary of the Lehigh River. This dam, which was to be located approximately eight miles northwest of Allentown, Pa., would provide flood control, water supply, and recreational opportunities to the area. A smaller dam than Tocks Island, Trexler was proposed as an eight-hundred-foot-long concrete structure, although the Corps later decided to make it an earth- and rockfill embankment. Authorized as part of the Delaware River Basin Comprehensive Plan, Trexler would cost approximately \$10

million and would store 55,000 acre-feet of water, of which 40,000 acre-feet would be used for water supply, with the balance set aside for flood control.<sup>45</sup>

By February 1971, the Philadelphia District had completed a general design memorandum for the dam, and in 1973, it published an environmental impact statement. This EIS included a discussion of eutrophication that could occur in the proposed lake. It noted that, although eutrophication would probably be an issue, it could be controlled by clearing “all vegetation, floatable structures and cesspool and septic tank contents” from the reservoir area before construction, as well as by controlling nutrients flowing into the reservoir after construction. In any case, after examining other options (including no construction, placing the dam elsewhere, building a series of small reservoirs, or regulating floodplain development), the Corps determined that the Trexler Lake Project was the best way to fulfill the flood control, water

supply, and recreational needs of the area.<sup>46</sup>

The district initially proposed beginning construction of Trexler Lake in 1973. However, the DRBC considered Tocks Island and Blue Marsh dams higher priorities than Trexler, and Congress appropriated no funds for Trexler in fiscal years 1974 through 1977. After the DRBC voted not to continue with the construction of Tocks Island Dam in 1975, its members decided to push the building of Trexler Lake, and in a fiscal year 1977 appropriations bill, Congress appropriated \$300,000 to begin land acquisition for the project. President Jimmy Carter promised to include \$1.5 million for the beginning of construction in an appropriations bill for fiscal year 1978.<sup>47</sup>

Much like Tocks Island, however, Trexler faced opposition from local residents and environmental groups, such as the Northwest Lehigh Citizens Association, which feared that the dam would be an environmental disaster. In 1976 and 1977, the Philadelphia District, under the



*Site of the proposed Trexler Lake Dam*

direction of District Engineer Col. Harry V. Dutchyshyn, held a series of public meetings in Lehigh County to explain more about the Trexler Project. In addition, on 14 April 1977, the district held a hearing to obtain input on the project, as required by Section 404 of the Federal Water Pollution Control Act of 1972. According to Dutchyshyn, approximately fifty supporters of the dam attended the hearing, along with five hundred opponents wearing green T-shirts with “Damn the Dam” printed in big yellow letters. Because of the number of people who wanted to speak, the meeting lasted until 2:00 in the morning, showing Dutchyshyn that “there was a lot of consternation” regarding the Trexler Lake Project.<sup>48</sup>

Testimony at the public hearing showed the positions of those in favor of the dam and those against it. For example, Maurice Goddard, representing the Pennsylvania Department of Environmental Resources, said that the commonwealth fully supported Trexler Lake “as an integral part of [the] comprehensive plan

for the development and management of the water resources of the Delaware River.” Likewise, Harry Bisco, representing the city of Allentown, said that the city government supported the project because it would provide “a source of water supply” as well as “significant protection against flooding along the banks of the Jordan River within the City.” Others vehemently opposed the project. Some of the opposition stemmed from the concern that the proposed reservoir would lead to an increase in development in the area, which would further encroach on agricultural lands. Others—much like opponents of Tocks Island—charged that the reservoir would have eutrophication problems, diminishing its potential for recreation. Still others believed that the only true beneficiaries of the project would be downstream utility companies, as the DRBC proposed using Trexler as a standby water supply in times of drought. Finally, several opponents of the project said that the citizens had never had an opportunity to vote on building the

dam. The hearing became heated at times, as proponents of the dam were booed heavily, leading Dutchyshyn on a couple occasions to ask the crowd to show more respect to the speakers. Clearly, there were strong feelings about Trexler.<sup>49</sup>

Because of the heavy opposition to the dam, Congressman Frederick Rooney (D-Pa.), who had originally supported the project, attempted to kill it. In June 1977, he got Congress to delete the Carter administration's promised \$1.5 million infusion for construction of the dam from its fiscal year 1978 budget. In answer to the critics who said local residents had never had an opportunity to vote on the dam, Rooney supported holding a public referendum in Lehigh County in the November 1977 election to determine whether enough public support existed for Trexler Dam. A group that supported the project—the PRO-LAKE Group—asked for a court injunction against the referendum, stating that it was illegal to hold “a local (non-binding) referendum on a

regional project,” but the court dismissed that argument. The referendum was held, and voters rejected the project by a ratio of three to one. Subsequently, the North Atlantic Division of the Corps recommended that the Philadelphia District halt its work, and the district recommended in 1978 that Trexler Lake be designated as an “inactive” project, which the chief of engineers supported. When Congress passed the Water Resources Development Act of 1986, it officially deauthorized construction of the Trexler Lake Dam.<sup>50</sup>

## **Beltzville Lake and Blue Marsh Lake**

Even as environmental concerns and local opposition scuttled the Tocks Island and Trexler Lake projects, the Philadelphia District continued forward on other dams proposed under the Delaware River Basin Comprehensive Plan. The Beltzville Lake Project was completed in 1971 and Blue Marsh Lake was dedicated in January 1979. In addition to providing water

supply and flood control, these two multipurpose dams were recreational facilities for their areas and improved the Philadelphia District's relations with the general public. Unlike Tocks Island and Trexler Lake, the construction of Beltzville and Blue Marsh dams proceeded without much controversy, although the Philadelphia District had to work through some issues at Blue Marsh.

Beltzville Lake, located on Pohopoco Creek just four miles east of Lehigh, Pa., was authorized as part of the Delaware River Basin Comprehensive Plan

*Beltzville Lake*



to provide flood protection to the communities of Allentown, Bethlehem, and Easton, and to provide water to Bethlehem and Palmerton. As one historian wrote, "The flood storage potential of Beltzville is significant in a region characterized by flash floods." The project also was designed to improve water quality in both Pohopoco Creek and the Lehigh River (of which the Pohopoco is a tributary), to prevent salinity intrusion into the Delaware River Basin, and to serve as a recreational area. Constructed at a cost of \$22.8 million, the earth- and rockfill dam had a storage capacity of 68,250 acre-feet; the majority was for water supply, water quality, and recreation, with the remaining capacity reserved for flood control.<sup>51</sup>

The provision for water quality at Beltzville was one of the innovative features of the dam. As one historian wrote, to provide for better water quality, the Philadelphia District included a multilevel intake system in the dam, which was "the first in any Corps of Engineers dam."

This system allowed the Corps to “permit the selective withdrawal and mixing of water from seven levels of the permanent storage pool,” which could “control the temperature and dissolved oxygen content of downstream releases.” In addition, Beltzville provided recreational opportunities such as fishing, swimming, and hiking, although the recreational features—known as Beltzville State Park—were actually operated by the Pennsylvania Bureau of State Parks under an agreement with the Corps (the Corps developed the master plan for recreation that the Pennsylvania Bureau of State Parks followed). Outside of recreation, all other project and dam operations were handled by the Corps.<sup>52</sup>

Blue Marsh Dam was another multipurpose facility constructed as part of the Delaware River Basin Comprehensive Plan. The Philadelphia District planned to construct the dam in the Tulpehocken Creek watershed, about 6.5 miles above the confluence of Tulpehocken Creek and the Schuylkill River, and



*Construction of the Blue Marsh Dam*

about 6 miles northwest of the city of Reading in Berks County in southeastern Pennsylvania. The dam, proposed as a ninety-eight-foot-high earth- and rockfill embankment, would provide flood control from Reading to Philadelphia, as well as water for the Reading-Pottstown area. Recreational opportunities were an important component of the project; one report stated that the lake would “be subjected to intensive public use because of its proximity to the large, densely populated area of southeastern Pennsylvania and its

unusually good accessibility.” As with Beltzville Dam, the Corps proposed to include a multilevel intake system to improve water quality downstream.<sup>53</sup>

Although the Philadelphia District did not have as tough a road to traverse with Blue Marsh as it did with Tocks Island and Trexler, it faced some perplexing issues. These included arsenic content in the lake, protection of the borough of Bernville from flooding because of the dam, and the protection of a significant historic resource that would be flooded when the reservoir filled. Addressing these issues required ingenuity on the part of district personnel.

The Philadelphia District originally planned to begin construction on Blue Marsh Dam in 1969, forecasting completion of the project by 1972. However, in 1968 a company that produced a “commercial organic arsenical compound” had discharged a large amount of arsenic into groundwater at a site twenty-seven miles upstream from the location of the proposed dam. When that company

was purchased by another firm, that firm began a process of removing arsenic from the groundwater, which required pumping the groundwater into Tulpehocken Creek. This resulted in “significant quantities of arsenic” in the “water and muds of the Tulpehocken Creek,” leading the Federal Water Quality Administration to state, according to Edward Conley of the EPA, “that the public water supply to be obtained from the proposed reservoir might contain in excess of 0.05 mg/l of arsenic,” which posed a potential health hazard.<sup>54</sup>

To deal with the arsenic issue, the district relied on the DRBC and the Pennsylvania Department of Health, Education and Welfare (PDHEW). The DRBC agreed in 1968 to implement a program “designed specifically to reduce the Tulpehocken drainage area of its arsenical compounds, prior to completion of the Blue Marsh Project.” On 21 May 1969, the DRBC met with state and federal representatives to discuss water quality. At this meeting, the group decided that “the impounded waters would be suitable for

fishing and for recreation” and that any water removed from Blue Marsh for domestic use would be treated to ensure that it met “the drinking water standards of the Commonwealth of Pennsylvania and the U.S. Public Health Service.”<sup>55</sup>

However, the chief of engineers did not want to proceed with construction until the Corps, in the words of one historian, had conducted “a detailed investigation . . . to establish that the waters of the impoundment would be safe for public use.” Accordingly, the Philadelphia District hired the Department of Environmental Sciences at Rutgers University to study the situation. The department took several samples of mud and water in Tulpehocken Creek and issued its report in 1973. The report concluded that “arsenic will always be present in the waters and muds of this reservoir,” but if aerobic conditions were maintained in the reservoir (by controlling the temperature of the water so that it did not exceed twenty-five degrees Celsius), the arsenic would remain in the bottom muds and the

reservoir water would not exceed arsenic levels of 0.050 mg/l. On the basis of this report, the chief of engineers and the leadership of the Philadelphia District decided that construction could continue, as long as the dam operators used the dam’s outlet system to maintain aerobic conditions.<sup>56</sup>

The Philadelphia District also had to implement measures to protect the borough of Bernville from flooding risks associated with the construction of the Blue Marsh Reservoir, as filling the reservoir had the potential of flooding the nearby community. The district held meetings with Bernville officials in 1968, 1969, and 1973 to discuss the measures the Corps would take. Essentially, these consisted of relocating and widening Route 183, one of the major roads in the area, and constructing a 4,800-foot-long protective levee on the southwest side of Bernville, along the north bank of Northkill Creek. The Corps also realigned part of the Tulpehocken Creek channel and provided “a pumping station, detention dams, gravity drains and ponding area, to



*Construction of the intake tower (above)  
and visitors center (below) at Blue Marsh*



prevent damage to the borough during high lake levels or flood stages on adjacent creeks.” However, the Philadelphia District encountered a problem when it became clear that construction of the levee would prevent the Bernville Fire Department from being able to access Tulpehocken Creek for its water supply. According to Vince Calvarese, who headed up the Blue Marsh design effort, the district solved this problem by constructing a concrete storage tank for the fire department. Such ingenuity served the Corps well in its work on Blue Marsh and enabled the Bernville Protective Works to be completed by the time of the dedication of the dam.<sup>57</sup>

Another issue arose with regard to a historic facility known as Gruber Wagon Works, located in the area that would be flooded when Blue Marsh Reservoir filled. In 1966, Congress had passed the National Historic Preservation Act (NHPA), which contained a section (Section 106) that required the heads of any federal or federally assisted project to “take into

account” the effects of undertakings “on any District, site, building, structure, or object that is included in or eligible for inclusion in the National Register”—a list of all “districts, sites, buildings, structures, and objects significant in American history, architecture, archaeology, engineering, and culture.” This provision meant that whenever the Corps began an undertaking, it had to determine what prehistoric or historic resources would be affected and consult with state historic preservation offices and the Advisory Council on Historic Preservation on how to avoid or mitigate the consequences on those resources.<sup>58</sup>

Before the passage of the NHPA, Temple University had completed an archeological survey of the Blue Marsh Dam site and had concluded in 1965 “that the area contained no sites of national significance,” perhaps because it focused only on archeological resources and not on above-ground structures. When the Philadelphia District began its real estate appraisal work in 1970, it discovered the Gruber Wagon Works, a



*Aerial view of the Blue Marsh Dam under construction*

three-level frame building on the east bank of Licking Creek that had existed “totally intact” from the “time where its physical development had virtually stopped some fifty years before.” Recognizing the potential significance of this structure, the district requested that the Pennsylvania Historical and Museum Commission and the Northeast Regional Office of the NPS examine the structure. This occurred in July 1970.<sup>59</sup>

The officials discovered that the works had been constructed in 1884 by a German-Swiss immigrant. According to a Philadelphia District report,



*The Gruber Wagon Works before (above) and during (below) relocation; its original site is now at the bottom of Blue Marsh Lake*



The first floor of the building contains the complete shop for the manufacture of wagons and wagon bodies including a forge. . . . The wagon works is in excellent condition[;] all of its machinery, equipment, hand tools, forge and carpentry shop are well maintained. The entire plant is in operating condition. The second floor has small machine tools and also contains the various parts and slopes for the construction of the wagons. There are several small farm wagons complete with the Gruber name and design as well as hay wagons, and wagons of other types apparently held for exhibit purposes. An elevator, hand or horse operated[, ] large enough for a long wagon is available to carry materials . . . from [the] 1st to 2nd floors. The third floor or loft level is mainly used for storage of materials.<sup>60</sup>

The shop's original machinery had been replaced in the early twentieth century; since then, it had essentially remained intact. Because of the historic significance of the wagon works, according to Murray H. Nelligan, NPS Landmark and National Register specialist, all parties agreed "that efforts should be made to salvage the building and its contents by

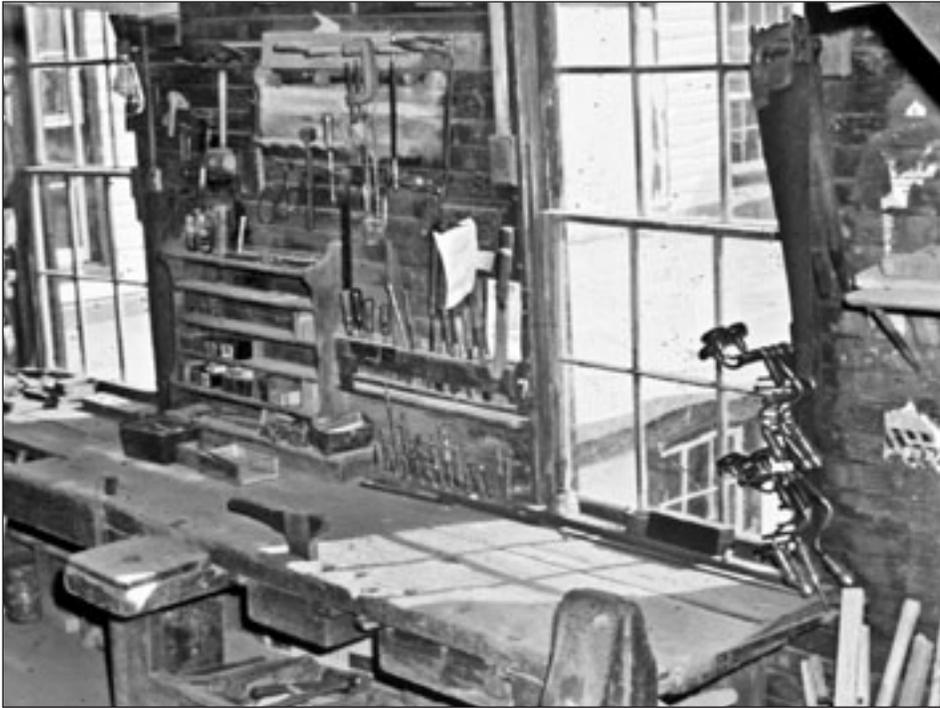
moving it to an appropriate spot in the projected state park, where it would be outside the reservoir area, and that each agency would explore possibilities for accomplishing this.”<sup>61</sup> Accordingly, the Philadelphia District began working with the NPS Historic American Engineering Record to document the structure and its contents “so that it can be reconstructed in a protected area.”<sup>62</sup>

The problem was that neither the NPS nor the commonwealth of Pennsylvania had the funding to move the works. The Corps, meanwhile, could pay for the “costs associated with purchase of the real property, transportation of the new structure to a new location, and provision of a foundation at the new site” but did not have authority to expend funds for “dismantlement and reassembly of the structure . . . and purchase of historically significant personal property within the building.”<sup>63</sup>

The need to preserve the building became even more important after the Advisory Council on Historic Preservation placed the wagon works on the National Register of

Historic Places on 2 June 1972. In November 1973, the Philadelphia District requested “the authority to expend funds necessary to relocate the building, complete with its contents, to a site on Government owned land,” and the district began working with Congress to get the legislation passed. It also consulted with Berks County and agreed to relocate the shop to a county park, where the county would assume operation and maintenance of the site.<sup>64</sup> The Corps found the money in 1974 to purchase the wagon works, as well as its equipment and furnishings, although it still did not have the money to relocate the structure.<sup>65</sup>

In May 1974, Congress passed the Archeological and Historic Preservation Act (known as the Moss-Bennett Act), permitting federal agencies to spend up to 1 percent of project funding to recover historic and archeological resources. This meant that the Philadelphia District could spend approximately \$430,000 to relocate the Gruber Wagon Works (1 percent of the estimated \$43 million price tag of Blue Marsh Dam); however,



*Tools inside the Gruber Wagon Works*

officials estimated that it would cost \$922,000 “to relocate and restore the original structure and its equipment.”<sup>66</sup> With strong grassroots support, Congress debated two bills in April 1975 that would provide funding to the Corps for the Gruber Wagon Works. These bills authorized the Corps “to relocate and restore intact the historic structure and associated improvements known as the Gruber Wagon Works” and provided appropriations “as may be necessary” for that to occur.<sup>67</sup> Congress eventually included the text of the bills in the Water Resources Development Act of 1976, which it

passed on 1 October 1976 and which President Gerald Ford signed on 22 October 1976. The act authorized the Corps to relocate and restore the wagon works “at an estimated cost of \$922,000.” After the Corps had effectuated the transfer, the legislation directed the Corps to transfer “title to the structure and associated improvements . . . to the County of Berks upon condition that such county agree to maintain such historic property in perpetuity as a public museum at no cost to the Federal Government.”<sup>68</sup>

With this funding and authorization, the Philadelphia District contracted with a team of historic preservation consultants, who worked on disassembling the wagon works, relocating it to its new home, and reassembling it. All of this work occurred in 1976 and 1977, and in April 1977 the reassembly was complete. In 1978 and 1979, the Corps also oversaw repair and renovation work to the structure to restore it to its original condition. As Calvarese later explained, “We cut it up into seven large pieces[.] . . . [I]t was very



old and very weak and we had to structurally support it all over and move it and reassemble it and make it structurally safe for the public to visit.”<sup>69</sup> With the restoration complete, the district turned the property over to Berks County in June 1980. However, because of the relocation, the Advisory Council on Historic Preservation removed the Gruber Wagon Works from the National Register of Historic Places, because it had lost the integrity of its original location. The Corps’ plan was to renominate the structure, but on 22 December

1977, the secretary of the interior designated the works as a National Historic Landmark, meaning that it “possess[ed] national significance and [was] considered to be of exceptional value in illustrating a specific theme in the history of the United States.” Because National Historic Landmarks enjoy the same protections as properties on the National Register, it was not necessary for the Corps to renominate the works.<sup>70</sup>

The relocation of the Gruber Wagon Works was a great accomplishment of the Philadelphia

*The Gruber Wagon Works in its new location*



*Blue Marsh Lake (above) provides flood risk reduction and water supply for Reading and Berks County, Pa., and its Corps ranger staff (below) hosts more than a million recreation visitors annually*



District in the 1970s. At a time when critics of the Corps labeled the agency's attention to cultural resources as "so rotten it had no way to go but up,"<sup>71</sup> it showed that the district cared about cultural artifacts under its control. Many observers noticed this. For example, A. R. Mortensen, director of the NPS Office of Archeology and Historic Preservation, lauded the district for the Gruber Wagon Works relocation: "We view this effort as a textbook example of

how this office can work with other Federal agencies to insure that our precious resources, both natural and cultural, can be preserved through sensitive planning and management."<sup>72</sup> Robert M. Vogel, chairman of the Smithsonian Institution's Department of Science and Technology, agreed: "The Corps clearly has recognized the extraordinary historical worth of the Gruber factory."<sup>73</sup> As an editorial in the *Reading Eagle* put it, "We're pleased that the [C]orps

understands the historical value embodied in the Penn Township structure and is taking such care in seeing that it is preserved.”<sup>74</sup>

Upon their completion, both the Blue Marsh and Beltzville dams performed their multipurpose function well. For example, even before Blue Marsh was dedicated, it had already prevented flooding on the Schuylkill River. In January 1978, the Corps operated the dam to impound four billion gallons of water resulting from a thaw after a heavy snowfall. The impoundment prevented “flooding of the Reading Sewage Treatment Plant” and “resulted in data for future use and a review of emergency procedures.”<sup>75</sup> In the words of one newspaper article, “This is the first time the dam was used for flood control since its completion.”<sup>76</sup> In June 2006, Blue Marsh again showed its flood control value when a series of storms over a weeklong period dumped rain on the Reading area. The dam prevented serious flooding in the city, although some did occur when the reservoir reached capacity and threatened to overtop the dam. However, the

spillway on the dam worked in the proper fashion and prevented overtopping. As Al Schoenebeck, supervisory resource manager at Blue Marsh, explained, the episode showed that the dam worked the way it was designed to work. “The control tower worked perfectly,” he said. “The spillway did the job it was supposed to by skimming off that increasing elevation to prevent overtopping of the dam.”<sup>77</sup>

Both Blue Marsh and Beltzville also became hallmarks of recreation in their respective areas, bringing accolades to the Corps. Beltzville became noted for its fishing; as one district publication said, it was the site of “some of the best [bass fishing] in Pennsylvania.”<sup>78</sup> Blue Marsh, meanwhile, had “many varied activities,” according to the district, “including swimming, fishing, boating (unlimited horsepower), sailing, cross-country and water skiing, hunting, hiking, bird-watching and picnicking.”<sup>79</sup>

The major difference between the two reservoirs was that the Philadelphia District still had charge of the recreational facilities

at Blue Marsh, while it transferred Beltzville's recreational operations to the commonwealth of Pennsylvania. Thus, Beltzville's



*Summer visitors taking in the swimming and boating opportunities at Blue Marsh Lake*



ranger staff were state employees, although two Corps employees were in charge of operations and maintenance at the dam. Blue Marsh, meanwhile, had its own full-time ranger staff (augmented by seasonal student hires for the peak summer months), as well as two dam operators, a maintenance worker, and an administrative secretary. These employees had various responsibilities, including “public relations, water safety and environmental education, wildlife habitat management, trail management, enforcement of laws and regulations, traffic control and computer operation.”<sup>80</sup> They performed these duties well—several rangers were recognized with local and national awards for everything from interpretive work to life-saving actions. Blue Marsh staff ran one of the district's most successful outreach programs, the Junior Ranger program, “designed to promote environmental awareness among the nation's youth, to educate them about the Corps' role in managing natural and water resources, and to get them involved helping Corps rangers

serve the public and protect those resources.” This and other volunteer programs, such as the annual Take Pride in Blue Marsh cleanup activity, earned national awards for the Philadelphia District in 1982, 1989, and 1993 for volunteer work programs.<sup>81</sup>

## The Level B Study and the Delaware Estuary Salinity Intrusion Study

Even with the success of the Blue Marsh and Beltzville dams, the Delaware River Basin area still faced water supply problems because of the cancellation of the Tocks Island and Trexler projects. As Tocks Island supporter Carmen F. Guarino, water commissioner for the city of Philadelphia, said in 1978, “I am at a loss for language to describe the potential danger, loss of economic base and other dire things that could be caused by not having an impoundment on the main stem of the Delaware.”<sup>82</sup> To determine how to go forward, the DRBC decided to conduct a “complete review of water needs, projections and possible supplies



*Blue Marsh Lake's extensive trail system attracts hikers, bicyclists, and equestrians, and includes one trail for people with disabilities*

for those needs for the 7 million in-Basin and 25 million out-of-Basin people who depend on the Delaware for water.”<sup>83</sup> Funded by the U.S. Water Resources Council, this review, known as the Level B study, became caught up in “good faith negotiations” among representatives of Pennsylvania, New York, New Jersey, and Delaware about how to revise the amount of water dedicated to each state as part of the 1954 Supreme Court water distribution decree. Former DRBC employee Richard Albert said, “Each activity fed information to the other, and the Level B study served as the forum for public input. . . . Water conservation,



*Volunteers helping with cleanup (top) and repair projects (bottom) during Take Pride in Blue Marsh Day, held every April in conjunction with Earth Day*

water supply, and flow maintenance were three of the elements of the Level B study that tied it to the Good Faith talks.”<sup>84</sup>

Both the Level B study and the good faith negotiations were informed by salinity studies conducted by the Philadelphia District

and the DRBC to provide information about the effects of salinity intrusion (whereby saltwater moves into fresh water) on the Delaware River Basin. In 1976, Congress had passed a resolution calling for the Corps to determine “the probability for advance or retreat of salinity in the Delaware Estuary and the quantity of fresh-water inflow needed to protect the various water users along the Estuary.”<sup>85</sup> To achieve these goals, the Corps undertook a study of “the economic impact of increased salinity on the lower basin industries and users,” while the DRBC analyzed various scenarios on the Delaware River to provide data on “the historic and projected extent of movement.”<sup>86</sup> Congress authorized this study in part because a severe drought that lasted from 1961 to 1966 increased salinity in the river to levels that “forced industries to close and municipalities to prepare emergency plans for rationing and obtaining alternate sources [of water].” The water supply of Camden and Philadelphia was especially affected. This led the DRBC “to urge studies to define

the relationship between river flow and salinity.”<sup>87</sup>

In completing the salinity study, the Corps focused on the Delaware estuary, which ran from the bay at Cape Henlopen to Trenton, N.J., and which was “the water gateway to the industrial and commercial complex located in the Delaware Valley.” In addition to being “an important spawning ground for finfish and shellfish,” the estuary (defined as an area “where fresh water draining from the land through rivers mixes with salt water carried by tidal action from the ocean”) provided water to both industry and municipalities.<sup>88</sup> The district’s first efforts consisted of analyzing the economic effects of salinity intrusion in the Delaware River. It concluded in 1980 that, in a drought year such as 1965, salinity-related costs for withdrawal uses of river water would be about \$32 million; in an average year, such as 1970, they would be about \$17.3 million. These costs were highest for domestic users of water and showed that salinity intrusion had a direct economic effect on water users.<sup>89</sup>

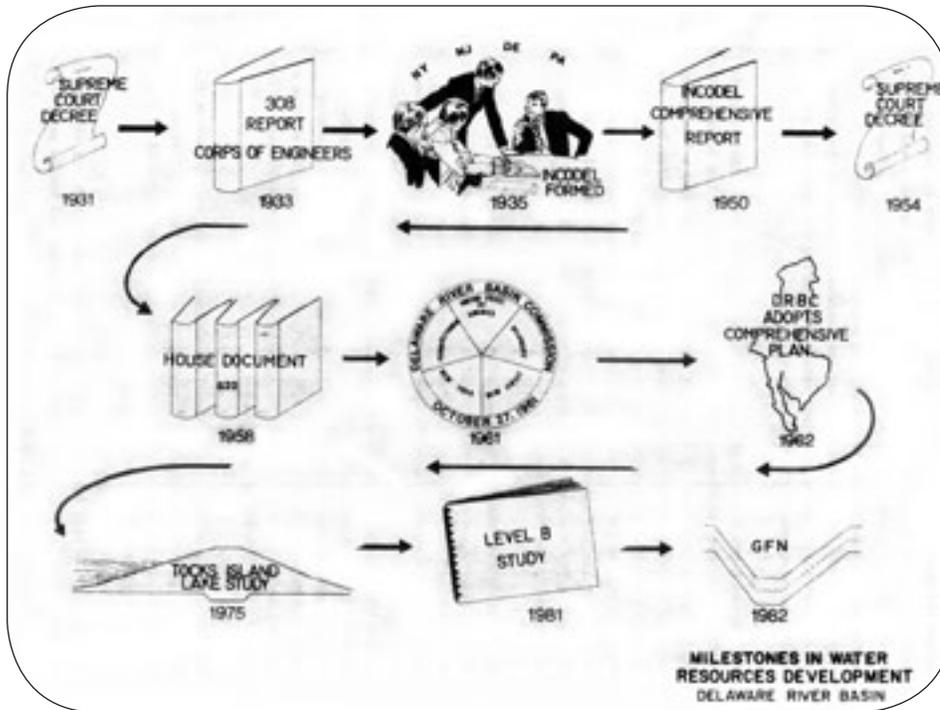


*Tidal wetlands along the Delaware Bay*

The DRBC’s salinity work was integrated into its Level B study, published in October 1979. To provide necessary water supply to the Delaware River Basin and flows that could better control salinity intrusion, the report recommended that the Philadelphia District enlarge F. E. Walter Reservoir (formerly known as Bear Creek Reservoir) on the Lehigh River and Prompton Reservoir on the Lackawaxen River. The report also suggested that the Corps look at enlarging Cannonsville Reservoir in New York and constructing Hackettstown Reservoir in New Jersey (later determined by the

*Map of the area covered by the Delaware Estuary Salinity Intrusion Study*





A chart showing milestones in water resources development on the Delaware River, including the Level B Study and the Good Faith Report

state of New Jersey to be infeasible). This would allow for a flow of three thousand cubic feet per second at Trenton, the standard that the DRBC set as necessary for limiting salinity levels in the Delaware River.<sup>90</sup>

In 1983, the good faith negotiators produced their own recommendations; many of these recommendations paralleled those of the Level B study, but some were new because of a drought that hit the Delaware River Basin in 1980 and 1981, generating new water supply fears and worries about salinity intrusion. As the report noted, "Protection against

salinity intrusion requires a volume of fresh water flow into the estuary and improved management on the part of those water users who are subject to the effects of salinity." Therefore, the good faith recommendations advocated for the DRBC to revise the salinity objective in its plan and for the Corps to modify Walter and Prompton dams to add another 420 cubic feet of water per second (290 from Walter, 130 from Prompton) in new flow augmentation. This would provide a flow augmentation of 750 cubic feet per second at Trenton, which would effectively guard against salinity intrusion. "As additional reservoir facilities and storage capacity become available in the Basin," the report continued, "they should be used both to augment water supply, and to improve environmental conditions, water quality, and salinity protection." The report also contained several recommendations pertaining to alleviating drought conditions in the basin, including more coordinated operation of New York City reservoirs with other Delaware River Basin reservoirs,

the development by states of drought contingency plans, and the adoption of criteria for reducing out-of-basin water diversions in times of drought.<sup>91</sup>

In 1983, the Philadelphia District produced its final report, the *Delaware Estuary Salinity Intrusion Study*. In essence, this was a compilation of the district's own economic findings, as well as the flow objectives and recommendations in the Level B study and the good faith negotiations report. As a public notice explained, "The report presents technical information including salinity-related costs incurred to direct water users, the impact of the Chesapeake and Delaware Canal, [and] probabilities of various salinity levels and the impacts of salinity variation on the fish and wildlife resources." According to the Corps, the report fulfilled the congressional requirements established in the 1976 resolution and demonstrated the cooperative effort between the Corps and the DRBC.<sup>92</sup>

The report noted that the Philadelphia District's work had enabled the DRBC to modify a

previously developed model of the Delaware estuary "to reflect more accurately the interaction of the Delaware estuary and the Chesapeake and Delaware Canal."

The Corps and the DRBC then used this model "to determine the probabilities of salinity levels in the estuary" and "to determine average annual salinity-related costs to estuarine water users." According to the DRBC, the Corps' work "provided much useful information on the ecologic and economic impacts of salinity in the Delaware estuary" and had been "an outstanding example of inter-agency cooperation from the very beginning."<sup>93</sup>

## **Modifications to Walter and Prompton Dams**

In the 1980s, as requested in both the Level B and good faith negotiation studies, the Corps began examining modifying both Walter Dam (originally Bear Creek Dam, renamed after Congressman Francis E. Walter [D-Pa.] in 1963) and Prompton Dam to provide low-flow augmentation to the

Delaware River and better water supplies. Walter Dam, completed in 1961, was located on the Lehigh River, approximately seventy-five



*General Edgar Jadwin Dam (above),  
Prompton Lake (below)*



miles above where the Lehigh connected with the Delaware River and about five miles north of White Haven, Pa. Prompton Dam, which was completed in 1960, was on the Lackawaxen River, approximately four miles west of Honesdale, Pa., and a half mile up from where the Waymart Branch enters the river. Congress had authorized modifications to these dams in the Flood Control Act of 1962, as part of the Corps' Delaware River Basin Comprehensive Plan. In that plan, the Philadelphia District had proposed to turn both dams (originally authorized as flood control dams) into multipurpose dams used for flood control, water supply, and recreation.<sup>94</sup> The Philadelphia District had completed a general design memorandum for the Prompton improvements in 1968 but had to halt its work because, as one historian explained, "the DRBC could not establish a current economic demand for additional water supply in the Prompton Lake service area." Likewise, the DRBC requested that the Walter modification be postponed until it had more information of the water

supply needs of the Delaware River Basin.<sup>95</sup>

By the mid-1970s, no modifications had occurred. Both dams had small recreational features run by the commonwealth of Pennsylvania, and the Corps scheduled periodic releases at Walter Dam to create whitewater conditions for rafting and canoeing, but no dam enlargements had been made. In 1974, the Philadelphia District issued a general design memorandum for the Walter modifications, as well as studies on the Prompton

Project. However, when engineering and design work was moved from the Philadelphia District to the Baltimore District after the demise of the Tocks Island Project, the Baltimore District assumed design functions for the modifications, although the Philadelphia District continued to provide technical support and advice. When the Corps issued a revised general design memorandum for Walter Dam in 1985, it was listed as a joint publication of the Baltimore and Philadelphia districts.<sup>96</sup>

*Francis E. Walter Dam*



Because of salinity and water supply concerns, the modifications of Walter and Prompton dams took on new urgency. In 1985, Gerald Hansler, executive director of the DRBC, informed Philadelphia District Engineer Lt. Col. Ralph Locurcio that the DRBC was willing to be the nonfederal sponsor of the Walter Dam modification, which was supposed to begin construction in fiscal year 1987, as Congress had appropriated funds for that purpose. Likewise, the DRBC “identified Prompton Reservoir as their first priority for make-up water during droughts in the basin,” making its modification vital as well.<sup>97</sup>

According to the modification plans, the Corps would raise Walter Dam thirty feet to provide an additional 70,000 acre-feet of water supply storage, increasing the storage capacity of the reservoir from 108,000 acre-feet to 178,000 acre-feet. It would also replace the dam’s control tower with a multigated tower. The Corps said that the “primary purpose of the modification” was “to provide a regional supply [of] water for the

Delaware River Basin” that could “be used to maintain flows in the Lehigh River, lower Delaware River and the Delaware Estuary during droughts.” For the Prompton Dam, the Corps would add 28,000 acre-feet of storage capacity and improve the recreational facilities to accommodate up to 156,000 visitors annually.<sup>98</sup>

However, the two projects soon ran into funding problems. As codified in the Water Resources Development Act of 1986, Congress modified cost-sharing provisions on flood control projects, stating that local interests would now be responsible for up to 50 percent of the cost of construction, operation, and maintenance. The legislation also stated that, in the words of one publication, “local interests [were] required to pay all costs allocated to water supply.” In the case of the Walter Dam modifications, this meant that the DRBC was responsible for approximately \$98.6 million in construction costs and \$84,000 a year for operation and maintenance. In addition, the DRBC had to pay half of the costs allocated for recreation, estimated

at \$11.7 million, and an annual operation and maintenance charge of \$111,000.<sup>99</sup> Because of other obligations, such as the nonfederal share of both the Beltzville and Blue Marsh dams, the DRBC would have had difficulty coming up with this money.

To resolve the funding issue, the DRBC proposed recovering some of the costs for both the Prompton and Walter modifications by imposing fees on Delaware River Basin water users, but this proposal ran into political complications. For one thing, Congress had included a provision in the Delaware River Basin Compact of 1961 that stated that the DRBC could not levy user fees on those water users existing at the time the compact was executed (which included most of the basin's major water users). For the DRBC to levy such fees, Congress would have to pass additional legislation. Senator Bill Bradley (D-N.J.) and Congressman Paul Kanjorski (D-Pa.) introduced various bills between 1985 and 1989 to allow the DRBC to charge user fees, but precompact water users vehemently



*Prompton Lake*

opposed the bills. With no legislation forthcoming, the DRBC could not provide the funding required for both Prompton and Walter.<sup>100</sup>

In response to this situation, the Corps suspended preconstruction and engineering design for the Prompton Dam modifications in fiscal year 1988. That same year, the DRBC announced that it was withdrawing its support for the Prompton Project, believing, according to one historian, that salinity standards “could be met under drought conditions by the combined augmented yields of the modified Walter project (when completed) and the new Merrill Creek Reservoir then being



*Construction of safety modifications to Prompton Dam in 2007*

constructed near Phillipsburg, N.J., by a consortium of electric utility companies.” When the DRBC presented a new Delaware River Basin drought management plan in 1992, it “omitted all reference to a need for the Prompton project through the year 2020.”<sup>101</sup> In 1993, Philadelphia District Engineer Lt. Col. R. F. Sliwoski noted that it was “uncertain” when studies for the Prompton modification would resume.<sup>102</sup>

In the case of Walter Dam, Congress removed the funds it

had appropriated for the project in its fiscal year 1990 budget and provided no further funding in subsequent years. Lieutenant Colonel Sliwoski explained in 1993 that the district was still “awaiting resolution of non-Federal financing issues” before it could proceed with Walter Dam construction. No resolution to the issues was forthcoming, and the Walter Dam modification never occurred.<sup>103</sup>

Because neither of these projects moved forward to construction, it would be easy to

lump them in with Tocks Island and Trexler, but this would be inaccurate. The Walter and Prompton modifications did not move forward almost entirely for financial reasons. Having experienced strong public opposition (on multiple fronts, in the case of Tocks Island) with the two former projects, the district made an earnest effort to incorporate public involvement and fully address environmental and cultural issues. As a result, the Walter and Prompton

projects proceeded as far as they did mostly without controversy.<sup>104</sup>

And even though the projects were scuttled, the Philadelphia District did some work on both Prompton and Walter dams. In 1993, for example, the district completed an evaluation of Prompton Dam to determine “the potential impacts that a range of floods would have on [its] hydrologic/hydraulic capability.” This study concluded that a probable maximum flood (PMF) in the area

*Rafters take on the rapids of the Lehigh River Gorge, enhanced by scheduled weekend releases from Francis E. Walter Dam*



would overtop the dam embankment by 5.5 feet. The Corps recommended that the spillway be widened and lowered to handle the PMF. The district received funding for Phase I of these modifications in fiscal year 2006 and completed modifications to the spillway and outlet works in July 2007. Construction of a crest wall along the top of the dam followed in 2008.<sup>105</sup>

In November 1988, Congress passed a law that authorized using Walter Reservoir for recreational purposes. Because recreation was not a primary function of the reservoir, the Corps did not maintain a ranger staff at the location, although the recreational aspect at Walter Reservoir soon became quite popular. In fact, the district had been making releases for whitewater rafting in cooperation with the commonwealth of Pennsylvania since 1968, eventually settling in at five scheduled events each year: two 2-day events in June and three 1-day events in September and October. Because of the multiple use of the water in the reservoir, the Philadelphia

District entered into a partnership with the Pennsylvania Fish and Boat Commission, the Pennsylvania Department of Conservation and Natural Resources, the DRBC, and other stakeholders in 2005 “to manag[e] flows out of the Francis E. Walter Dam into the Lehigh River.” The district established a Francis E. Walter Dam Flow Management Working Group for this purpose, which had the goal of “striking an optimal balance among legitimate yet sometimes competing interests in terms of natural resource management and recreational opportunities.”<sup>106</sup> This group developed a flow management plan each year that would allow for whitewater releases in the summer and fall while preserving the dam’s flood control capacity and providing sufficient water in the reservoir to ensure “cooler deep-water temperatures and better spawning opportunities for fish.”<sup>107</sup> In 2005, the Corps completed construction of a new road over Walter Dam, replacing an old road that “flooded during heavy rainfall and was often rendered impassable.”<sup>108</sup> By

allowing increased water storage, the new road enabled the Corps “to release water 22 times a year, up from seven,” thus providing better rafting opportunities while maintaining a stable pool in June to enhance in-lake fisheries and making fisheries releases throughout the summer for the downstream reach of the Lehigh River.<sup>109</sup>

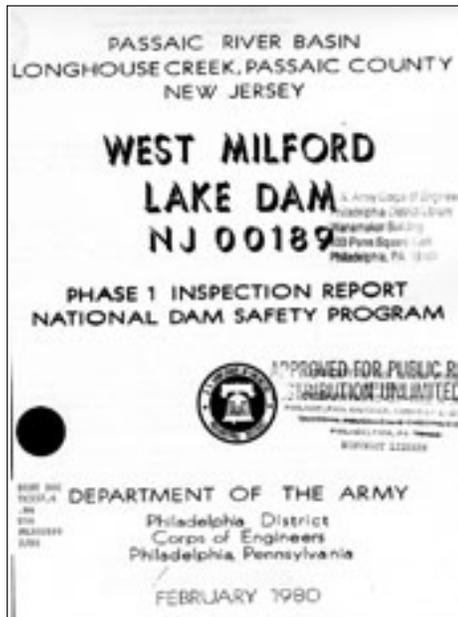
## National Dam Safety Inspection Program

In addition to constructing new dams, modifying old ones, and working in other ways to increase water supply, flood control, and recreational opportunities, the Philadelphia District became involved in the National Program of Inspection of Dams that the Corps led in the 1970s. After the heavy rainfall that accompanied Hurricane Agnes caused the overtopping of some dams, and after other disasters such as the breach of the Canyon Lake Dam in Rapid City, South Dakota, in 1972, Congress enacted a law that directed the Corps to “carry out a national program of inspection of

dams for the purpose of protecting human life and property.” The act covered all dams in the United States except those constructed by the Bureau of Reclamation, those built with a Federal Power Commission license, and those that had been inspected by a state agency in the twelve months before the enactment of the legislation. The Corps was directed to inform states of its findings and convey a report to Congress that included an inventory of all of the dams in the United States, the recommendations made to states, and “recommendations for a comprehensive national program for

*Construction of the new bypass road leading across the crest of F. E. Walter Dam, allowing seasonal inundation of the original service road behind the dam*





*The Philadelphia District's report on the West Milford Lake Dam in New Jersey, conducted as part of the Corps' National Dam Safety Program*

the inspection, and regulation for safety purposes of dams of the Nation.<sup>110</sup>

In May 1975, the Corps issued its report. It stated that the dams included in the inventory were those “which are 25 feet or more in height or have a maximum impounding capacity of 50 acre-feet or more.” Of the 49,329 dams inventoried, approximately 20,000 were “so located that failure or misoperation of the discharge facilities could result in loss of human life and appreciable or greater property damage.” The report recommended that Congress institute a National Dam Safety Program, executed either by states (over dams not under federal authority) or by federal agencies that had jurisdiction over the dams. The program would include “the inspection of all existing dams having a high or significant hazard potential.”<sup>111</sup> President Carter authorized the National Dam Safety Program in fiscal year 1978.

In accordance with the Corps’ plan, the Philadelphia District conducted investigations of a number of dams in the late 1970s and early

1980s. The district was responsible for inspecting all dams in New Jersey and Delaware, even those within the civil works boundaries of the New York and Baltimore districts; it began its work with Spruce Run Dam in Clifton, N.J., on 12 December 1977.<sup>112</sup>

The report the district released in August 1979 to New Jersey Governor Brendan T. Byrne on its inspection of Longwood Lake Dam in Morris County, N.J., was fairly representative. According to Col. James G. Ton, District Engineer, this dam had been classified as “a high hazard potential structure,” but the Corps determined after the inspection that it was “in fair overall condition” and “a low hazard potential structure.” However, Ton did note that the dam’s spillway was “inadequate” and that analyses should be performed to determine how to improve the spillway. Ton also recommended that the dam’s owner “initiate a program of periodic inspection and maintenance, the complete records of which should be kept on file.” He asked that the state keep the district informed

regarding how it implemented these recommendations.<sup>113</sup>

Looking at a somewhat more critical example, in 1980 the district inspected Lake Como Dam in Kent County, Del., which was found to be in “poor overall condition” and “a significant hazard potential structure.” The district questioned whether the structure had adequate stability and recommended that the spillway be addressed, “since nine percent of the Spillway Design Flood (SDF) would cause the dam to be overtopped.” To address these inadequacies, the Corps recommended that the owner hire a professional engineer with dam construction and design experience to analyze “what measures are required to provide adequate spillway discharge capacity and/or to protect the embankment from overtopping.” The engineer would also implement erosion protection measures and would remove trees and utility poles from the embankment. The report said that “continuous monitoring of reservoir levels during periods of heavy precipitation should be undertaken

until permanent repairs are completed.” As with the Longwood Lake Dam, Colonel Ton requested that the state notify him “of proposed actions . . . to implement our recommendations.”<sup>114</sup>

When the district’s dam safety inspection work ended in September 1981, it had inspected 404 dams classified as significant hazards, the vast majority of which were in New Jersey. Of these dams, the district declared fifteen Delaware dams and fifty-three New Jersey dams unsafe. In the years since 1981, the Corps has continued its dam inspection work, becoming involved with the Federal Emergency Management Agency’s (FEMA’s) National Dam Safety Program through participation in the Interagency Committee on Dam Safety, a coalition of “federal agencies that build, own, operate, or regulate dams.”<sup>115</sup> In addition, the Philadelphia District established its own Dam Safety Committee in 1983, which worked in cooperation with similar committees in both the North Atlantic Division and the Office of the Chief of Engineers. The committee

had various functions, including heightening public awareness of dam safety, preparing emergency action plans and local evacuation plans, and ensuring that the dams under the district's jurisdiction were safe. As John Burnes, chair of the committee in 2009, explained, "Twice a year [the] committee . . . meets and looks at all of our dam projects to make sure they're safe and operable and being maintained and provided for." In this way, the district continues to ensure the safety of dams for residents in the Delaware River Basin area.<sup>116</sup>

And the district's inspection program was not confined to dams. In 1955, Congress passed a law (Public Law 84-99) amending the Flood Control Act of 1941 by establishing "an emergency fund" that the Corps could use for "flood emergency preparation" or "the repair or restoration of any flood-control work threatened or destroyed by flood."<sup>117</sup> Under this act, the Philadelphia District's Operations Division (with technical support from the Engineering Division) conducted inspections on both federal and

nonfederal flood control works (which included levees, channels, dams, and hurricane and shore protective structures) to determine whether a structure was active (rated as acceptable or minimally acceptable in its last inspection) or inactive (had previously been rated unacceptable). Active projects were eligible for rehabilitation funding under PL 84-99. The Corps also examined structures to make sure that proper maintenance was being performed. When work needed to be done on a structure, the Corps supervised it.<sup>118</sup> For example, in 1996 and 1997, the district conducted a PL 84-99-funded levee repair project in Stroudsburg, Pa. This project involved placing 2,700 tons of rock on a two-hundred-foot section of a levee lining McMichaels Creek. The total cost of the project, which provided flood protection to "more than 40 local businesses," was \$161,370.<sup>119</sup> Thus, work performed under PL 84-99 was another way for the Philadelphia District to help communities and agencies maintain the integrity of flood control structures.

## Molly Ann's Brook Project

As the twentieth century wore on, dams became less and less acceptable as a means to provide flood control, water supply, and recreation, in part because of their environmental effects and in part because local sponsors could not come up with the large amounts of money required for dam construction under the Water Resources Development Act of 1986. But although dams became less popular, the problems they had the potential to solve remained. As John Burnes explained, when projects were killed, it did not mean that the needs they intended to address went away. "Believe me," he said in 2009, "there are [still] such needs, such as flood control and . . . water supply."<sup>120</sup> The Corps examined other ways of addressing these needs. For example, nonstructural solutions such as floodplain management became more prevalent in flood control, as well as structural projects that did not involve the construction of large dams. The largest flood control project the district undertook after

constructing Blue Marsh Dam was the Molly Ann's Brook Project (which, by virtue of geography, actually belonged to the New York District).<sup>121</sup>

Molly Ann's Brook is a tributary of the Passaic River in northern New Jersey. The brook flows through the communities of Haledon, Prospect Park, and Paterson, and had a history of flooding often, especially in Paterson and Haledon. Significant floods occurred in 1945, 1968, 1971, and 1977, causing damage to both residences and businesses (some \$10 million from the November 1977 flood alone). In 1984, the New York District completed a feasibility study recommending stream channel modifications and construction of concrete flumes in a three-mile section of Molly Ann's Brook between Haledon and the confluence with the Passaic River in Paterson, to reduce potential damages related to a fifty-year flood event.<sup>122</sup>

The project was authorized for construction in 1986 with an estimated total cost of \$22 million,



*A section of the Molly Ann's Brook Flood Control Project*

and the New Jersey Department of Environmental Protection (NJDEP) was identified as its nonfederal sponsor.<sup>123</sup> At the time, the New York District had more work than it could handle so, in May 1989, Molly Ann's Brook became a Philadelphia District project. First, the district "reaffirmed" the New York District's flood control plans and began preparing a Phase II general design memorandum. Then, in October 1991, the district and NJDEP held a public meeting on the project in Paterson, N.J., attended by "congressional interests, local governmental representatives, and the public." According to the district, all of

those interests "continued to support the project and urged its expeditious construction."<sup>124</sup>

In 1992, the district issued its Phase II general design memorandum, which called for channel modification, concrete flume construction, modifications to five bridges, and construction of retaining walls, all prefaced by the removal of an old warehouse that sat directly over the brook. As Richard Maraldo, the district's former deputy for program management, related, the project had "channels, flood walls, levees, riprap sections, . . . almost every engineering feature for flood control you can think of, other than a dam."<sup>125</sup>

In 1993, Congress appropriated funding to begin construction, and by September 1999, the project was 90 percent constructed. Then Tropical Storm Floyd hit the region, collapsing the Belmont Avenue Bridge in Haledon and setting back project completion. Congress provided additional funding in fiscal years 2006 and 2007, and the project was completed in 2008. Approximately

thirty years after the original study and twenty years after the Philadelphia District took over project management, the Corps had replaced five bridges, created “a modified walled 2.5-mile-long channel,” and removed several buildings to significantly reduce the potential for flood damage along the brook.<sup>126</sup>

Indeed, when the Corps announced the completion of the Molly Ann’s Brook Project, Philadelphia District Engineer Lt. Col. Gwen Baker noted that the project had already fulfilled many of its objectives. “From Tropical Storm Floyd to the heavy rains of last spring,” Baker said, “the Molly Ann’s Brook project has been carrying out its mission of flood damage reduction—not trying in vain to prevent or control flooding, but reducing its impact on lives and livelihood.” Stephen Kempf, regional administrator for FEMA, agreed: “The Molly Ann’s Brook project has significantly mitigated the risk of flooding in this area.” Likewise, Congressman Bill Pascrell Jr. (D-N.J.) “applaud[ed] the Army

Corps for working with me to see this project through to completion.” Pascrell said that the Corps’ work reduced the floodplain and “free[d] dozens of home and business owners from . . . having to pay [for] costly flood insurance policies.” According to Pascrell, the project was “overdue, but sure to benefit generations to come.”<sup>127</sup>

## Continuing Authorities Program

Along with these larger flood control projects, the Corps provided flood damage reduction benefits under the Continuing Authorities Program (CAP), which allowed it to construct smaller scale projects (ranging from \$500,000 to \$5 million) without specific congressional authorization. As stated on the Philadelphia District’s website, “This decreases the amount of time required to budget, develop, and approve a potential project for construction.” Under various authorities, the Corps could work on small projects for flood control, navigation, beach erosion control, emergency stream-bank and shoreline protection,

snagging and clearing, and environmental improvement projects. For flood control, Section 205 of the Flood Control Act of 1948 (as amended) authorized the Corps to construct small projects up to a maximum federal share of \$7 million without congressional authorization, as long as the chief of engineers had signed off on the project and as long as “the work shall be complete in itself and not commit the United States to any additional improvement to insure its successful operation.”<sup>128</sup>

According to a Corps publication, these projects could occur “only after detailed investigation clearly shows [their] engineering feasibility, environmental acceptability, and economic justification.”<sup>129</sup> The Philadelphia District outlined the way such projects would occur. The Corps would first receive a request from a city, county, or state to examine the water resource problem. The district would investigate the matter through a site visit to determine whether there was an “adequate federal interest.” If so, the Corps would proceed with a

reconnaissance study (which could last anywhere from six to eighteen months), which would conclude “whether an economically justifiable solution to the problem exists” and which would recommend a local sponsor for the project. If the project was economically justified, the Corps would proceed with a feasibility study (lasting anywhere from one to two years), up to 50 percent of which had to be funded by the local sponsor. The district would then prepare specifications and plans for the project, request approval from the assistant secretary of the Army for civil works, and issue a request for proposals for construction, which in some cases was completed within three to six months of contract award.”<sup>130</sup>

The Philadelphia District completed several projects under CAP, especially after the late 1970s, when large flood control projects became less desirable to the general public. One of its earliest CAP projects dealt with Little Mill Creek, a tributary of the Christina River in New Castle County, Del. In 1959, the Philadelphia District had conducted a reconnaissance

study of flooding problems in the Little Mill Creek watershed, but it ultimately determined that the plan of improvement would exceed the amount authorized under CAP (at that time \$1 million). After a large flood hit the region in August 1967, causing \$625,000 in damages, the county and state requested that the Corps implement the plan. With the local sponsors willing to take on a larger share of the cost, the Corps began developing a plan for the creek involving “constructing a retention basin, improving channels, and increasing stream-flow capacity of bridges.”<sup>131</sup>

However, after the Corps completed a detailed project report on Little Mill Creek in July 1973, the state and county withdrew their support of the project, and nothing was ever done. Additional reports completed by the Philadelphia District in the 1980s on Little Mill Creek did not produce any action, but after a devastating flood in July 1989 caused more than \$10 million in damages, the Delaware Department of Natural Resources and Environmental Control requested that the Corps conduct



*Construction of the Little Mill Creek Flood Control Project in Delaware*

another flood control study under the Section 205 authorization. In 1991, the Corps published a reconnaissance report, recommending that it conduct “detailed feasibility studies of the flood control problems along Little Mill Creek” and develop a definite project report for the area.<sup>132</sup>

Over the next several years, the Philadelphia District made plans for Little Mill Creek, dividing the project area into upper and lower reaches. According to one Corps report, the plans included deepening the channel of the stream by three feet and stabilizing, widening, and modifying the stream bank. In 2002, the Little Mill Flood Abatement Committee (established in 1991 by Delaware’s General Assembly “to oversee and



*Assembling one of the gabion retaining wall sections for Little Mill Creek*

direct activities for flood control”), the state of Delaware, and the Corps signed a project cooperation agreement that allowed the project to begin. After construction of the upper reach work was completed in July 2007, the district began reevaluation of the lower reach work (leading to a second construction project slated for 2012 completion). The federal share of the cost of the entire project was \$7 million, with the local sponsor (the state of Delaware) contributing \$2.5 million.<sup>133</sup>

The district conducted a similar project at Aquashicola Creek in Palmerton, Pa. This creek had flooded often over the years,

generating as much as \$1 million in damages in a 1996 flood. Under CAP, the district partnered with the borough of Palmerton in the 1990s to remove sediment from the creek and conduct stream-bank improvements over a one-mile stretch of the waterway. The total cost of the project, which was dedicated in May 1999, was \$2.5 million.

Both the district and the community were pleased with the results. According to Philadelphia District Engineer Lt. Col. Debra Lewis, the project was “a perfect example of what can be accomplished when a community, the private sector and government partner with each other.” Julie Merkel, a resident of Palmerton whose property had been flooded three times by Aquashicola Creek, agreed. “It’s wonderful,” she said. “I didn’t think I’d see this in my lifetime.”<sup>134</sup>

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The Philadelphia District’s flood control efforts encompassed a variety of activities in the period between 1972 and 2008, reflecting changes in the United States as a whole. In 2008, the district faced a much different world than in

1972. In many areas, dams were no longer an option for flood control and water supply; instead, nonstructural measures were considered to be more comprehensive solutions, often with the significant added benefit of being seen as more environmentally friendly. Although Blue Marsh, Beltzville, and the proposed Walter modification were relatively noncontroversial projects that were favorably regarded even in the twenty-first century, other dam construction projects—most notably Tocks Island and Trexler—were halted in the 1970s owing to a combination of environmental advocacy and local politics that trumped other regional and national interests.

By the 1990s, most of the Corps' work to reduce flood risks involved either a combination of less ambitious structural measures, such as at Molly Ann's Brook, or locally focused solutions under CAP. The Philadelphia District also continued to provide valuable inspection and rehabilitation services for flood control projects operated and maintained by others, especially in eastern Pennsylvania.

With these responsibilities, the district helped protect communities and populations under its jurisdiction, providing a measure of security and safety for residents in the Delaware River Basin. 🏰

*The Aquashicola Creek Flood Control Project in Palmerton, Pa., during construction (top) and after completion (bottom)*



<sup>1</sup> Delaware River Basin Commission, 1993 Annual Report, 6, Technical Library, U.S. Army Corps of Engineers, Philadelphia District, Philadelphia, Pennsylvania (hereafter referred to as Philadelphia District-Library).

<sup>2</sup> "Comprehensive Report on the Development of the Water Resources of the Delaware River Basin, Syllabus," in House, *Delaware River Basin, New York, New Jersey, Pennsylvania and Delaware: Letter from the Secretary of the Army Transmitting a Letter from the Chief of Engineers, Department of the Army, Dated April 2, 1962, Submitting a Report . . . On a Review of the Delaware River and Tributaries . . .*, in *Eleven Volumes*, 87th Cong., 2d sess., 1962, H. Doc. 522, 1:a (hereafter referred to as H. Doc. 522); see also Richard C. Albert, *Damming the Delaware: The Rise and Fall of Tocks Island Dam*, 2nd ed. (University Park, Pa.: Pennsylvania State University Press, 1987), 44–46.

<sup>3</sup> "Comprehensive Report on the Development of the Water Resources of the Delaware River Basin, Syllabus," 1:a.

<sup>4</sup> David Bell, Director, Bureau of the Budget, to Honorable Cyrus R. Vance, Secretary of the Army, 17 July 1962, in H. Doc. 522, 1:vii; see also Snyder and Guss, *The District*, 194–198.

<sup>5</sup> Delaware River Basin Commission, "DRBC Overview" <<http://www.state.nj.us/drbc/over.htm>> (2 March 2010); Edward Voigt, Chief, Public and Legislative Affairs, Philadelphia District, personal communication with Joshua Pollarine, 4 April 2011.

<sup>6</sup> Gina Bloodworth, "Tocks Island Dam, the Delaware River and the End of the Big-Dam Era," Ph.D. dissertation (State College, Pa.: Pennsylvania State University Graduate School, Department of Geography, 2005), xviii–xiv.

<sup>7</sup> "Where Are They Now? 1968-1971: Col. James A. Johnson," *The Observer* (September/October 1998): 13.

<sup>8</sup> Quotations in Albert, *Damming the Delaware*, 27-28, 31; see also Unpublished Morgan Draft District History, 31.

<sup>9</sup> Quotation in H. Doc. 522, 1:99; see also "Tocks Island Lake, Pennsylvania, New Jersey and New York, Pertinent Data," Loose Papers, Box 503, Administrative Records, U.S. Army Corps of Engineers, Philadelphia District, Philadelphia, Pennsylvania (hereafter referred to as Philadelphia District-AR); see also "Interstate Water Management: Recommendations of the Parties to the U.S. Supreme Court Decree of 1954 to the Delaware River Basin Commission Pursuant to Commission Resolution 78-20," draft, July 1982, v, Loose Papers, Box 5276, Philadelphia District-AR; Albert, *Damming the Delaware*, 51–58, 62–64, 70, 74; Unpublished Morgan Draft District History, 31; Flood Control Act of 1962 (76 Stat. 1173 at 1182).

<sup>10</sup> Margaret S. Nichols, "Showdown at Tocks Island," *Field & Stream* 80 (August 1975): 14; Unpublished Morgan Draft District History, 32–33.

<sup>11</sup> Albert, *Damming the Delaware*, 75–80.

<sup>12</sup> Albert, *Damming the Delaware*, 77–80.

<sup>13</sup> Delaware River Basin Commission, "Summary of Report on the Tocks Island Region Environmental Study," 16 November 1970, copy in New Jersey State Library, Trenton, New Jersey.

<sup>14</sup> Luther J. Carter, *The Florida Experience: Land and Water Policy in a Growth State* (Baltimore, Md.: Resources for the Future, Johns Hopkins University Press, 1974), 26.

<sup>15</sup> Keith S. Krause, Chief, Technical Services Branch, Division of Water Supply and Pollution Control, Department of Health, Education, and Welfare, to Major General W. K. Wilson, Jr., Chief of Engineers, 29 December 1961, in H. Doc. 522, lxxvii–lxxviii.

<sup>16</sup> Environmental Defense Fund, "Evaluation of the Proposed Tocks Island Reservoir Project," February 1972, Summary, copy in Yale University Library, New Haven, Connecticut.

<sup>17</sup> Quotations in Albert, *Damming the Delaware*, 103–109; see also Russell E. Train, Chairman, Council on Environmental Quality, to Mr. Belieu, February 3, 1972, Loose Papers, Box 503, Philadelphia District-AR.

<sup>18</sup> Unpublished Morgan Draft District History, 39–40; Albert, *Damming the Delaware*, 109–111; U.S. Army Corps of Engineers, Office of History, *Engineer Profiles: Major General James A. Johnson, U.S. Army, Retired* (Washington, D.C.: U.S. Army Corps

of Engineers, Office of History, n.d.), 227. Cahill was not alone in objecting to the impact of visitation on New Jersey's road system. According to an article in *Parks and Recreation*, the National Park Service estimated providing 40,000 parking spaces in the recreational area. "The uniform emptying of those spaces within four hours on a summer Sunday evening would send 10,000 cars per hour into the area's already inadequate road system." Charles A. Stansfield, Jr., "The Tocks Island Controversy," *Parks and Recreation* 7 (March 1972): 33.

<sup>19</sup> Unpublished Morgan Draft District History, 40-41.

<sup>20</sup> Albert, *Damming the Delaware*, 113–119; see also Unpublished Morgan Draft District History, 42–43.

<sup>21</sup> Nichols, "Showdown at Tocks Island," 14.

<sup>22</sup> Albert, *Damming the Delaware*, 113–123; Unpublished Morgan Draft District History, 43–44. The Environmental Defense Fund, for example, released two reports in 1972 and 1973 that advocated nonstructural flood control solutions, while the Save the Delaware Coalition issued a study in 1973 that explored means to produce a greater water supply and flood control.

<sup>23</sup> Philadelphia District-AR, "Summary and Evaluation, Tocks Island Lake Project: Compliance with National Environmental Policy Act of 1969," Loose Papers, Box 503, Philadelphia District-AR.

<sup>24</sup> As cited in Stansfield, "The Tocks Island Controversy," 31.

<sup>25</sup> Albert, *Damming the Delaware*, 125.

<sup>26</sup> Patricia Barnes-Svarney, "Awful Agnes," *Weatherwise* (May/June 2002): 40. The Philadelphia District's response to Agnes is discussed in greater detail in Chapter Six.

<sup>27</sup> Quotations in *Engineer Profiles: Major General James A. Johnson*, 232; see also Albert, *Damming the Delaware*, 126.

<sup>28</sup> *Engineer Profiles: Major General James A. Johnson*, 230; Dave Pierce, "Long Arm of Government Changed the Poconos Forever," *Pocono Record*, 12 August 2001; Elizabeth Rosbach, "Why Do They Have to Leave?" *New York Times*, 27 September 1981 (Sunday, Late City Final Edition).

<sup>29</sup> Quotation in Albert, *Damming the Delaware*, 132–142; see also Dave Pierce, "Displaced Homeowners, 'Hippie' Land Squatters Discuss Painful Past," *Pocono Record*, 12 August 2001.

<sup>30</sup> Vince Calvarese telephone interview by Joshua Pollarine, 19 January 2010, transcript, 15.

<sup>31</sup> John Burnes interview by Paul Sadin and Joshua Pollarine, 15 January 2009, Philadelphia, Pennsylvania, transcript, 11.

<sup>32</sup> Quotation in Nichols, "Showdown at Tocks Island," 14; Unpublished Morgan Draft District History, 44–45; Albert, *Damming the Delaware*, 128–131, 143.

<sup>33</sup> URS/Madigan-Praeger, Inc., and Conklin & Rossant, *A Comprehensive Study of the Tocks Island Lake Project and Alternatives, Vol. B—Review of Tocks Island Lake Project* (New York: URS/Madigan-Praeger, Inc., 1975), IX-87, IX-98–100.

<sup>34</sup> Quotation in Albert, *Damming the Delaware*, 145–146; Unpublished Morgan Draft District History, 46–47.

<sup>35</sup> Quotation in Water Resources Association of the Delaware River Basin, Annual Report, 1975, copy in File 1517-03 (Water Resources Assoc. of Delaware River Basin) Annual Reports, Box 239, Philadelphia District-AR; see also Albert, *Damming the Delaware*, 146; Unpublished Morgan Draft District History, 47–48.

<sup>36</sup> S. 3106, "A Bill to terminate the authorization for the Tocks Island Reservoir Project as part of the Delaware River Basin project, and for other purposes," copy in Senate Subcommittee on Water Resources of the Committee on Public Works, *Tocks Island Deauthorization: Hearings Before the Subcommittee on Water Resources of the Committee on Public Works, United States Senate, 94th Cong., 2nd sess., 1976, 23–26* (hereafter referred to as Tocks Island Deauthorization Hearings).

<sup>37</sup> Tocks Island Deauthorization Hearings, 56–58 (quotation from the chief of engineers is given by Rep. Millicent Fenwick [R-N.J.] on p. 30).

<sup>38</sup> Statements or testimony from the senators and representatives mentioned in this paragraph begin on the following pages in Tocks Island Deauthorization Hearings: 3, 5, 8, 11, 27, 30, 37, 38, 42, 45, 47, 50.

<sup>39</sup> Tocks Island Deauthorization Hearings, 69, 90–92.

<sup>40</sup> Albert, *Damming the Delaware*, 149.

<sup>41</sup> Quotation in Act of 2 October 1968 (82 Stat. 906); see also Albert, *Damming the Delaware*, 150.

<sup>42</sup> Quotation in National Parks and Recreation Act of 1978 (92 Stat. 3467 at 3483–3484, 3527); see also Unpublished Morgan Draft District History, 50–51.

<sup>43</sup> Burnes interview, 10. As an example of the type of criticism levied by some against the Philadelphia District, in 1981, Rep. Robert W. Edgar (D-Pa.) charged Philadelphia District Engineer Colonel James G. Ton with “talking lovingly about the Tocks Island Dam” as if he were “hoping that maybe through some congressional magic we would put the Tocks Island Dam back in place and begin to move in that direction.” Ton strongly objected to this, stating that “the [C]orps is not an advocate of any project. We are not going to build any project that is not supported by the Delaware River Basin Commission who represent the States of New York, New Jersey, the Commonwealth of Pennsylvania, and Delaware.” House Subcommittee on Water Resources of the Committee on Public Works and Transportation, *Water Resources Problems Affecting the Northeast: The Drought, and Present and Future Water Supply Problems: Hearings Before the Subcommittee on Water Resources of the Committee on Public Works and Transportation, House of Representatives, 97th Cong., 1st sess., 1981, 797.*

<sup>44</sup> See, for example, Leslie A. Pappas, “Troubled Water for River Towns: After Repeated Floods, N.J. and Pa. Look for Solutions,” *Philadelphia Inquirer*, 24 April 2005; Martin Gansberg, “New Jersey Journal,” *New York Times*, 11 August 1985.

<sup>45</sup> H. Doc. 522, 1:109; see also Unpublished Morgan Draft District History, 51–52.

<sup>46</sup> Department of the Army, Philadelphia District, Corps of Engineers, *Lehigh River Basin, Trexler Lake, Jordan Creek, Pennsylvania: Final Environmental Impact Statement* (Philadelphia: Department of the Army, Philadelphia District, Corps of Engineers, 1973), 1-3, 3-10 – 3-11.

<sup>47</sup> Unpublished Morgan Draft District History, 52–53.

<sup>48</sup> Quotations in Harry Dutchyshyn telephone interview by Joshua Pollarine, 3 August 2009, transcript, 13–14; see also Unpublished Morgan Draft District History, 54.

<sup>49</sup> Department of the Army, Philadelphia District, Corps of Engineers, “Lehigh River Basin, Trexler Lake, Jordan Creek, Pennsylvania: Public Hearing Transcript taken at Parkland Senior High School, Orefield, Pa., under Provisions of Section 404, Federal Water Pollution Control Act Amendments of 1972,” Philadelphia District-Library. The transcript for this hearing is 186 pages long. Toward the end of the hearing, one speaker “noted that by my count 30 proponents of the dam have spoken but 60 opponents have spoken” (p. 147).

<sup>50</sup> Quotations in Raymond H. Snyder, “Report of the Lehigh Basin Group – May 16, 1978,” in “Nineteenth Annual Report of the Water Resources Association of the Delaware River Basin, WRA/DRB, for the Calendar Year 1977,” 12, File 1517-03 (Water Resources Assoc. of the Delaware River Basin) Annual Reports, Box 239, Philadelphia District-AR; see also Unpublished Morgan Draft District History, 55–57.

<sup>51</sup> Quotation in Snyder and Guss, *The District*, 216; see also H. Doc. 522, 1:105; Unpublished Morgan Draft District History, 17-19.

<sup>52</sup> Quotations in Unpublished Morgan Draft District History, 18; see also U.S. Army Corps of Engineers, Philadelphia District, “Lehigh River Basin, Pohopoco Creek, Pennsylvania: Beltzville Lake, Design Memorandum No. 18A, Appendices to the Master Plan, Recreation-Resource Management,” April 1974, copy in Philadelphia District-Library; “Department of the Army, Lease for Public Park and Recreational Purposes, Beltzville Lake,” Lease No. DACW61-1-72-124, 19 August 1971, File 1110-2-1150a Planning & Development Correspondence, Box 6 of 9, Accession No. 077-97-0001, RG 77, FRC.

<sup>53</sup> Quotation in Office of the District Engineer, U.S. Army Engineer District, Philadelphia, Corps of Engineers, “Design Memorandum No. 5, Schuylkill River Basin, Tulpehocken Creek, Pennsylvania, Blue Marsh Dam and Reservoir: Land Requirements Plan – Public Use,” 3, copy in Philadelphia District-Library; see also H. Doc. 522, 2:113; Department of the Army, Philadelphia District, Corps of Engineers, *Blue Marsh Lake: Design Memorandum No. 14, Reservoir Clearing* (Philadelphia: Department of the Army, Philadelphia District, Corps of Engineers, 1974), 2-1; Unpublished Morgan Draft District History, 20–21.

<sup>54</sup> Quotations in Edward J. Conley, Federal Activities Coordinator, U.S. Environmental Protection Agency, to Colonel James A. Johnson, District Engineer, Philadelphia District, 21 January 1971, in U.S. Army Engineer District, Philadelphia, “Environmental Statement: Blue Marsh Lake Project, Tulpehocken Creek, Pennsylvania,” April 1971, copy in Philadelphia District-Library; see also Unpublished Morgan Draft District History, 21-22.

<sup>55</sup> James F. Wright, Delaware River Basin Commission, to Colonel James A. Johnson, District Engineer, U.S. Army Engineer District, Philadelphia, 2 December 1970, in “Environmental Statement: Blue Marsh Lake Project.”

<sup>56</sup> Quotations in Department of Environmental Sciences, Rutgers, The State University, “Final Report: ‘Investigation of the Arsenic Conditions at the Blue Marsh Lake Project Site, Pennsylvania,’” v–vi, Appendix A, U.S. Army Engineer District, Philadelphia, Pennsylvania, “Supplement to the Final Environmental Impact Statement, Blue Marsh Lake Project, Tulpehocken Creek, Pennsylvania,” June 1973, copy in Philadelphia District-Library; see also “Supplement to the Final Environmental Impact Statement,” 21–23; Unpublished Morgan Draft District History, 23–24.

<sup>57</sup> Quotation in U.S. Army Corps of Engineers, Philadelphia District, “Blue Marsh Lake” (pamphlet), File 1110-2-1150a Planning & Development Correspondence, Box 6 of 8, Accession No. 077-03-0002, RG 77, FRC; see also Vince Calvarese telephone interview by Joshua Pollarine, 19 January 2010, transcript, 7; Unpublished Morgan Draft District History, 21; Department of the Army, Philadelphia District, Corps of Engineers, “Schuylkill River Basin, Tulpehocken Creek, Pennsylvania, Blue Marsh Lake: Design Memorandum No. 13, Bernville Protective Works,” 3–4, File 7 Bernville Protective Works D.M. No. 13, Vol. II, Box 5 of 9, Accession No. 077-89-0004, RG 77, FRC; Robert Corrigan for Daniel E. Price, Chief, Project Management Branch, Memo for Record, 15 August 1975, File 1 Bernville Local Protection—P&S (Pertinent Correspondence), Box 5 of 9, Accession No. 077-89-0004, RG 77, FRC.

<sup>58</sup> Quotations in “National Historic Preservation Act of 1966, as amended through 1992,” in U.S. Department of the Interior, *Federal Historic Preservation Laws* (Washington, D.C.: U.S. Department of the Interior, 1993), 7, 9–10, 22; see also Mike Wallace, *Mickey Mouse History and Other Essays on American Memory* (Philadelphia: Temple University Press, 1996), 190.

<sup>59</sup> Quotations in John Milner Associates, “Historic Structures Report, Gruber Wagon Works, Blue Marsh Lake, Berks County, Pennsylvania,” 28 April 1978, 8–10, Philadelphia District-Library; see also John F. Wrocklage, Chief, Planning Division, North Atlantic Division, to District Engineer, Philadelphia, 12 June 1970, in Office of the District Engineer, U.S. Army Engineer District, Philadelphia, Corps of Engineers, “Schuylkill River Basin, Tulpehocken Creek, Pennsylvania, Blue Marsh Lake: Preliminary Case Report on Gruber Wagon Works, Pleasant Valley, Pennsylvania,” May 1975, E-66, Philadelphia District-Library.

<sup>60</sup> H. Fein, Chief, Relocation & Recreation Section, to Ch, Design Br., 29 July 1970, in “Preliminary Case Report on Gruber Wagon Works,” E-60 – E-61.

<sup>61</sup> Murray H. Nelligan, Landmark and National Register Specialist, to Director, Northeast Region, 10 July 1970, in “Preliminary Case Report on Gruber Wagon Works,” E-62 – E-63.

<sup>62</sup> Lieutenant Colonel Samuel J. Newsom, Jr., Deputy District Engineer, to Mr. Eric DeLony, Historic American Engineering Record, n.d., in “Preliminary Case Report on Gruber Wagon Works,” E-49.

<sup>63</sup> Worth D. Phillips, Chief, Engineering Division, to Mr. Harold E. Yoder, Jr., Historical Society of Berks County, 13 September 1973, in “Preliminary Case Report on Gruber Wagon Works,” E-48.

<sup>64</sup> Quotation in Worth D. Phillips, Chief, Engineering Division, to Division Engineer, 20 November 1973, in "Preliminary Case Report on Gruber Wagon Works," E-44 – E-45; see also Board of County Commissioners to Colonel C. A. Selleck, Jr., District Engineer, 21 February 1974, *ibid.*, E-37.

<sup>65</sup> John Milner Associates, "Historic Structures Report," 13–14.

<sup>66</sup> Quotation in Colonel V. L. Rathburn, Assistant Director of Civil Works, Atlantic, Corps of Engineers, to Dr. A. R. Mortensen, Director, Office of Archeology and Historic Preservation, National Park Service, 27 February 1975, in "Preliminary Case Report on Gruber Wagon Works," E-14 – E-15; see also James Kahn, "History Takes a Step Forward," *Water Spectrum* 7 (Fall 1975): 40.

<sup>67</sup> S. 1497, in *Congressional Record*, 94th Cong., 1st sess., 22 April 1975, 121:11176.

<sup>68</sup> Act of 22 October 1976 (90 Stat. 2917, at 2927–2928).

<sup>69</sup> Calvarese interview, 4.

<sup>70</sup> John Milner Associates, "Historic Structures Report," 19–20; Unpublished Morgan Draft District History, 29.

<sup>71</sup> Robert M. Vogel, quoted in Kahn, "History Takes a Step Forward," 40.

<sup>72</sup> A. R. Mortensen, Director, Office of Archeology and Historic Preservation, to Colonel V. L. Rathburn, Office of the Chief of Engineers, 18 March 1975, in "Preliminary Case Report on Gruber Wagon Works," E-12 – E-13.

<sup>73</sup> Robert M. Vogel, Chairman, Department of Science and Technology, 7 October 1974, in "Preliminary Case Report on Gruber Wagon Works," E-23.

<sup>74</sup> "Army Engineers Help Preserve Old Wagon Works," *Reading Eagle* (Reading, Pa.), 16 September 1974.

<sup>75</sup> Quotations in R. B. Jaggard, Resident Engineer, Blue Marsh Lake Project, to District Engineer, 27 February 1978, File 1519-10 DACW61-74-C-0229 Impoundment, Box 299, Philadelphia District-AR; see also "Blue Marsh Dam Begins to Pay Off," *Reading Eagle*, 28 January 1978.

<sup>76</sup> Ellen R. Schwartz, "Blue Marsh Gates Closed," *Reading Eagle*, 27 January 1978.

<sup>77</sup> Al Schoenebeck interview by Joshua Pollarine, 14 January 2009, Leesport, Pennsylvania, transcript, 7–8.

<sup>78</sup> "Hit Beltzville for Bass," *The Observer* (Summer 2007): 17.

<sup>79</sup> U.S. Army Corps of Engineers, Philadelphia District, "Blue Marsh Lake" (pamphlet), copy in File 1110-2-1150a Planning & Development, Correspondence, Box 6 of 8, Accession No. 077-03-0002, RG 77, FRC.

<sup>80</sup> "Getting to Know Northern Area Office (Corps Dams)," *The Observer* (May/June 2000): 10.

<sup>81</sup> Quotations in "Junior Rangers Learn How They Can Take Care of Our Resources," *The Observer* (May 1996): 5; see also "Blue Marsh Ranger Honored by Corps," *The Observer* (September 1996): 3; "District Employee Wins National Education Award," *The Observer* (Winter 2007/2008): 7; "'Blue Marsh Day' Draws Hundre[d]s for Clean Up Project," *The Observer* (Spring 2008): 7.

<sup>82</sup> Carmen F. Guarino, Water Commissioner, to Sen. Richard Schweiker, 14 August 1978, File DRBC's Material, Box 5061, Philadelphia District-AR.

<sup>83</sup> Water Resources Association of Delaware River Basin, 1977-78 Annual Report, File 1517-03 (Water Resources Assoc. of Delaware River Basin) Annual Reports, Box 239, Philadelphia District-AR.

<sup>84</sup> Albert, *Damming the Delaware*, 157–158.

<sup>85</sup> House Committee on Public Works and Transportation, Resolution, 23 September 1976, File Congressional Resolution, Box 347, Philadelphia District-AR.

<sup>86</sup> First quotation in *Water Resources Problems Affecting the Northeast*, 792; second quotation in "Memorandum of Agreement Between the United States of America and the Delaware River Basin Commission," File DRBC—Correspondence, Box 347, Philadelphia District-AR.

<sup>87</sup> Quotations in U.S. Army Corps of Engineers, Philadelphia District, "Delaware Estuary Salinity Intrusion Study: Reconnaissance Report, Stage 1 – Water Resources Survey Investigation," December 1978, 2, Box 503, Philadelphia District-AR; see also William B. Strandberg, "Control of Salinity Intrusion in the Delaware River Estuary: A Report to the Delaware River Basin Commission," January 1975, 1-2, File DRBC—Health-Related Salinity, Box 5059, Philadelphia District-AR.

<sup>88</sup> U.S. Army Corps of Engineers, Philadelphia District, "Delaware Estuary Salinity Intrusion Study: Reconnaissance Report," 7, 10.

<sup>89</sup> U.S. Army Corps of Engineers, Philadelphia District, "Delaware Estuary Salinity Intrusion Study: Executive Summary of the Report 'Economic Study of Salinity Costs in the Delaware Estuary,'" February 1980, 8, 10, File Material for Col's. Speech, Box 347, Philadelphia District-AR.

<sup>90</sup> Albert, *Damming the Delaware*, 162–163.

<sup>91</sup> Quotations in "Interstate Water Management: Recommendations of the Parties to the U.S. Supreme Court Decree of 1954 to the Delaware River Basin Commission Pursuant to Commission Resolution 28-20 (with appendices)," draft, July 1982, Loose Papers, Box 5276, Philadelphia District-AR; see also Albert, *Damming the Delaware*, 166–169; see also "Additional Questions and Answers, Delaware Estuary Salinity Intrusion Study," File Delaware River Estuary Salinity Intrusion, FY 82 Budget, Box 347, Philadelphia District-AR. The 1980–81 drought also resulted in a contract between the Corps and the DRBC to use 27,880 acre-feet of storage space in Beltzville Reservoir "to impound water for anticipated future demand or need for water supply." "Contract Between the United States of America and the Delaware River Basin Commission for Water Storage Space in Beltzville Lake," 16 September 1980, File Beltzville and F. E. Walter Contracts, Box 3 of 5, Accession No. 077-96-0013, RG 77, FRC.

<sup>92</sup> "Division's Public Notice: Notice of Report, Delaware Estuary Salinity Intrusion Study," File Coordination with NAD, Box 5277, Philadelphia District-AR.

<sup>93</sup> First quotation in Delaware River Basin Commission to Colonel Baldwin, 12 November 1982, File DRBC—Correspondence, Box 347, Philadelphia District-AR; second quotation in Gerald M. Hansler, Executive Director, Delaware River Basin Commission, 27 August 1980, *ibid.*

<sup>94</sup> See H. Doc. 522, 96, 102.

<sup>95</sup> Unpublished Morgan Draft District History, 63–65.

<sup>96</sup> See Philadelphia District, Office of the District Engineer, "Lehigh River, Pennsylvania: Francis E. Walter Dam and Reservoir, Design Memorandum No. 10, Revised Master Plan," August 1974, 1-1, Box 503, Philadelphia District-AR; "Lehigh River Basin, Lehigh River-Bear Creek, Pennsylvania, Francis E. Walter Dam (Modified), Cost and Benefit Methodology," January 1978, 6, Box 5276, Philadelphia District-AR; Philadelphia District, "Lackawaxen River Basin, Wayne County, Pennsylvania: Reconnaissance Report, Proposed Rehabilitation of Prompton Dam Upstream Slope," August 1977, Philadelphia District-Library; "1989 Lehigh River Whitewater Events," U.S. Army Corps of Engineers, Philadelphia District, News Release, File 1105-2-40a F. E. Walter Newspaper Articles, Box 3 of 5, Accession No. 077-96-0013, RG 77, FRC; Unpublished Morgan Draft District History, 66.

<sup>97</sup> Quotation in Charles J. Kulp, Supervisor, U.S. Fish and Wildlife Service, to Lt. Colonel G. William Quinby, District Engineer, Philadelphia District, 9 March 1988, File 1110-2-1150a Planning & Development Corresp., Box 3 of 9, Accession No. 077-97-0001, RG 77, FRC; see also Gerald M. Hansler to Lt. Colonel Ralph V. Locurcio, District Engineer, 24 October 1985, File F. E. Walter (Modified), Water Storage Contract, Box 6 of 9, *ibid.*

<sup>98</sup> Quotations in U.S. Army Corps of Engineers, Philadelphia District and Baltimore District, "Modification of the Francis E. Walter Dam and Reservoir, Lehigh River Basin, Pa., General Design Memorandum: Main Report and Environmental Impact Statement," August 1985, Syllabus, copy in Regional Center for Environmental Information, U.S. Environmental Protection Agency Region III, Philadelphia, Pennsylvania; see also "Draft, F.E. Walter Dam Project," 3, File 1110-2-1150a Planning & Development Correspondence, FE Walter, Internal Coordination, Box 6 of 9, Accession No. 077-97-0001, RG 77, FRC; Unpublished Morgan Draft District History, 64.

<sup>99</sup> “Francis E. Walter Dam, Pennsylvania, Modification, Flood Control Reservoir Project,” File 1110-2-1150a Planning & Development Correspondence, Box 6 of 9, Accession No. 077-97-0001, RG 77, FRC.

<sup>100</sup> “Draft, F.E. Walter Dam Project,” 4; Bruce E. Stewart, Executive Director, to Honorable Robert P. Casey, Governor of Pennsylvania, 19 February 1990, File 1110-2-1150a Planning & Development Correspondence, FE Walter, Internal Coordination, Box 6 of 9, Accession No. 077-97-0001, RG 77, FRC; Unpublished Morgan Draft District History, 68-69; Albert, *Damming the Delaware*, 179–180.

<sup>101</sup> Unpublished Morgan Draft District History, 70–71.

<sup>102</sup> Lieutenant Colonel R. F. Sliwoski, District Engineer, to Honorable Joseph M. McDade, 27 April 1993, File 1110-2-1150a Planning & Development Correspondence, Walter General Corresp., Box 6 of 9, Accession No. 077-97-0001, RG 77, FRC.

<sup>103</sup> Quotation in Sliwoski to Honorable Joseph M. McDade, 27 April 1993; see also “Draft, F.E. Walter Dam Project,” 4; Stewart to Casey, 19 February 1990; Unpublished Morgan Draft District History, 68-69; Albert, *Damming the Delaware*, 179-180.

<sup>104</sup> Voigt personal communication.

<sup>105</sup> U.S. Army Corps of Engineers, Philadelphia District, “Project Factsheet: Prompton Lake, Prompton, PA, January 2010,” <[http://www.Philadelphia.District.usace.army.mil/cePhiladelphia.District-dp/projects/factsheets/PA/5OM\\_Prompton%20Lake.pdf](http://www.Philadelphia.District.usace.army.mil/cePhiladelphia.District-dp/projects/factsheets/PA/5OM_Prompton%20Lake.pdf)> (13 April 2011).

<sup>106</sup> U.S. Army Corps of Engineers, Philadelphia District, “Francis E. Walter Dam Flow Management Working Group” <<http://www.Philadelphia.District.usace.army.mil/Projects/FEWalter/index.htm>> (1 April 2010); Voigt personal communication.

<sup>107</sup> Sarah Fulton, “Walter Dam Presents Aggressive Water Release Plan,” *The Morning Call* (Allentown, Pa.), 17 February 2006.

<sup>108</sup> “Kanjorski Officially Opens New Road at Francis E. Walter Dam, Increasing Dam’s Capacity,” News Release, 6 July 2005, The Kanjorski News Room <[http://kanjorski.house.gov/index.php?option=com\\_frontpage&Itemid=103](http://kanjorski.house.gov/index.php?option=com_frontpage&Itemid=103)> (1 April 2010).

<sup>109</sup> Tom Long, “New Road at Walter Dam Will be Boon to Tourism, Officials Say,” *Citizensvoice.com*, 7 July 2005; Voigt personal communication.

<sup>110</sup> Quotations in Act of 8 August 1972 (86 Stat. 506); see also Department of the Army, Office of the Chief of Engineers, *National Program of Inspection of Dams* (Washington, D.C.: Department of the Army, 1975), 1:2.

<sup>111</sup> Lieutenant General W. C. Gribble, Jr., Chief of Engineers, Memorandum for Secretary of the Army, 16 May 1975, in Department of the Army, *National Program of Inspection of Dams*, 1: vi–viii.

<sup>112</sup> Unpublished Morgan Draft District History, 111.

<sup>113</sup> Colonel James G. Ton, District Engineer, to Honorable Brendan T. Byrne, Governor of New Jersey, 25 September 1979, in Department of the Army, Philadelphia District, Corps of Engineers, “Passaic River Basin, Rockaway River, Morris County, New Jersey, Longwood Lake Dam, NH 00333: Phase I Inspection Report, National Dam Safety Program,” copy in Philadelphia District-Library.

<sup>114</sup> Colonel James G. Ton, District Engineer, to Honorable Pierre S. DuPont, Governor of Delaware, 17 February 1981, in Department of the Army, Philadelphia District, Corps of Engineers, “Delaware River Basin, Mill Creek, Kent County, Delaware, Lake Como Dam, DE 00028: Phase I Inspection Report, National Dam Safety Program,” copy in Philadelphia District-Library.

<sup>115</sup> Quotations in FEMA, “The National Dam Safety Program: 25 Years of Excellence” <[http://www.fema.gov/library/file;jsessionid=990ABE86437E65977608FE9C65955AB3.WorkerLibrary?type=publishedFile&file=ndsp\\_25\\_years.pdf&fileid=2995cdf0-3d90-11db-8620-000bdba87d5b](http://www.fema.gov/library/file;jsessionid=990ABE86437E65977608FE9C65955AB3.WorkerLibrary?type=publishedFile&file=ndsp_25_years.pdf&fileid=2995cdf0-3d90-11db-8620-000bdba87d5b)> (2 April 2010); see also FEMA, “About the National Dam Safety Program” <<http://www.fema.gov/plan/prevent/damfailure/ndsp.shtm>> (2 April 2010). The Water Resources and Development Act of 1996 formally established the National Dam Safety Program under FEMA’s direction.

<sup>116</sup> Quotation in Burnes interview, 27; see also “Dam Safety Committees Meet,” *The Observer* (May 1993): 7.

<sup>117</sup> Act of 28 June 1955 (69 Stat. 186).

<sup>118</sup> U.S. Army Corps of Engineers, Philadelphia District, “Corps Rehabilitation & Inspection Program” <<http://www.Philadelphia.District.usace.army.mil/emo/fcw-list.htm>> (12 April 2010).

<sup>119</sup> Quotations in “District Finishes Up 84-99 Levee Repairs at Stroudsburg,” *The Observer* (September/October 1997): 6; see also “Allentown & Stroudsburg: Bringing the Levees Back to Life,” *The Observer* (October 1996): 13.

<sup>120</sup> Burnes interview, 8.

<sup>121</sup> Voigt personal communication.

<sup>122</sup> U.S. Army Corps of Engineers, New York District, “Passaic River Basin, New Jersey and New York, Phase I – General Design Memorandum: Interim Report on Flood Protection Feasibility, Molly Ann’s Brook, Haledon, Prospect Park, Paterson, N.J.,” November 1984, 1–3, 18–19, 45, File 1105-2-40a Molly Ann’s Brook Interim Report on Flood Protection Feasibility FY 90, Box 7168, Philadelphia District-AR.

<sup>123</sup> Water Resources Development Act of 1986 (100 Stat 4082, 4119).

<sup>124</sup> U.S. Army Corps of Engineers, Philadelphia District, “Molly Ann’s Brook Flood Control Project, Haledon, Prospect Park and Paterson, N.J.: Draft, Phase II General Design Memorandum, Main Report,” March 1992 (hereafter referred to as Phase II GDM), Box 7168, Philadelphia District-AR.

<sup>125</sup> Quotation in Richard Maraldo interview by Joshua Pollarine, 19 August 2009, Philadelphia, Pennsylvania, transcript, 34; see also Phase II GDM, Syllabus.

<sup>126</sup> U.S. Army Corps of Engineers, Philadelphia District, “Project Factsheet: Molly Ann’s Brook, Haledon, Prospect Park & Paterson, N.J.,” October 2009 <<http://www.Philadelphia.District.usace.army.mil/cePhiladelphia.District-dp/projects/factsheets/NJ/Molly%20Anns%20Brook.pdf>> (6 April 2010); “Pascrell Joins Army Corps to Announce Completion of Molly Ann’s Brook Flood Damage Reduction Project,” Press Release, 21 April 2008 <[http://pascrell.house.gov/list/press/nj08\\_pascrell/Pascrell\\_Joins\\_Army\\_Corps\\_To\\_Announce\\_Completion\\_Of\\_Molly\\_Anns\\_Brook\\_Flood\\_Damage\\_Reduction\\_Project.shtml](http://pascrell.house.gov/list/press/nj08_pascrell/Pascrell_Joins_Army_Corps_To_Announce_Completion_Of_Molly_Anns_Brook_Flood_Damage_Reduction_Project.shtml)> (6 April 2010).

<sup>127</sup> All quotations in “Pascrell Joins Army Corps to Announce Completion of Molly Ann’s Brook Flood Damage Reduction Project.”

<sup>128</sup> Quotation in Act of 30 June 1948 (62 Stat. 1171); see also U.S. Army Corps of Engineers, Philadelphia District, “Continuing Authorities Program” <<http://www.Philadelphia.District.usace.army.mil/cePhiladelphia.District-pl/ca.htm>> (2 April 2010).

<sup>129</sup> U.S. Army Corps of Engineers, Walla Walla District, “Section 205: Authority for: Flood Damage Reduction Projects” <<http://www.nww.usace.army.mil/html/pub/ap/facts/sec205.pdf>> (5 April 2010).

<sup>130</sup> U.S. Army Corps of Engineers, Philadelphia District, “Continuing Authorities Program.”

<sup>131</sup> Quotation in Department of the Army, Philadelphia District, Corps of Engineers, “Announcement of Public Meeting on Small Flood Control Project for Little Mill Creek, New Castle County, Delaware,” in “Corps of Engineers, Small Flood Control Project for Little Mill Creek, New Castle County, Delaware, Transcript of proceedings held on Tuesday, September 12, 1972,” (see also pp. 9–10 of this transcript), File 1110-2-1150a Planning & Development, Correspondence, Box 4, Accession No. 077-97-0001, RG 77, FRC.

<sup>132</sup> Quotations in “Little Mill Creek, New Castle County, Delaware, Flood Control Study (Section 205), Reconnaissance Report, July 1981,” 83–84, File 1110-2-1150a Planning & Development, Correspondence, Little Mill Creek July 1991 Recon., Box 4, Accession No. 77-97-0001, RG 77, FRC; see also “Little Mill Creek PCA Signed,” *The Observer* (September/October 2002): 4.

<sup>133</sup> Quotations in “Little Mill Creek PCA Signed,” *The Observer* (September/October 2002): 4–5; see also U.S. Army Corps of Engineers, Philadelphia District, “Project Factsheet: Little Mill Creek, New Castle County, DE, October 2009” <<http://www.Philadelphia.District.usace.army.mil/cePhiladelphia.District-dp/projects/factsheets/DE/Little%20Mill%20Creek%20NCC.pdf>> (5 April 2010).

<sup>134</sup> All quotations and information in “Flood Protection Comes to Palmerton: Residents Applaud Work Completed at Aquashicola Creek,” *The Observer* (May/June 1999): 4.